OCTOBER, 1939

ELECTRICAL SOUTH

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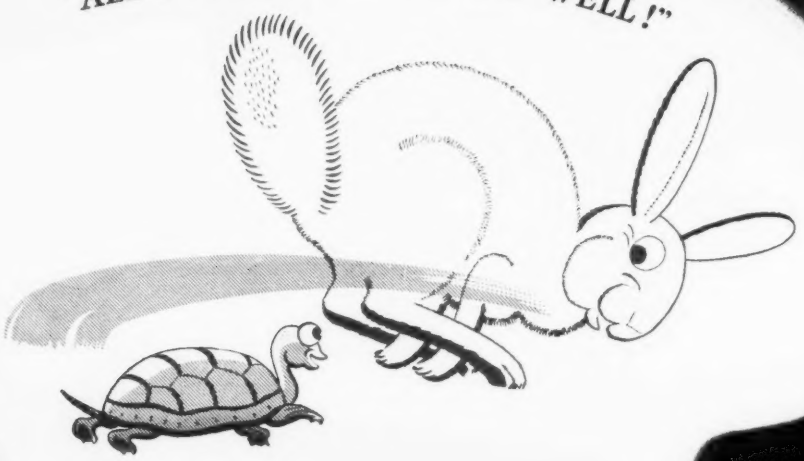

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"HANG THE LOAD ON HUBBARD HARDWARE"

OCTOBER
1939

Volume 19 No. 10

ELECTRICAL SOUTH

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ATLANTA, GEORGIA

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Published Monthly by
W. R. C. SMITH
PUBLISHING CO.
Marietta and Atlanta, Ga.

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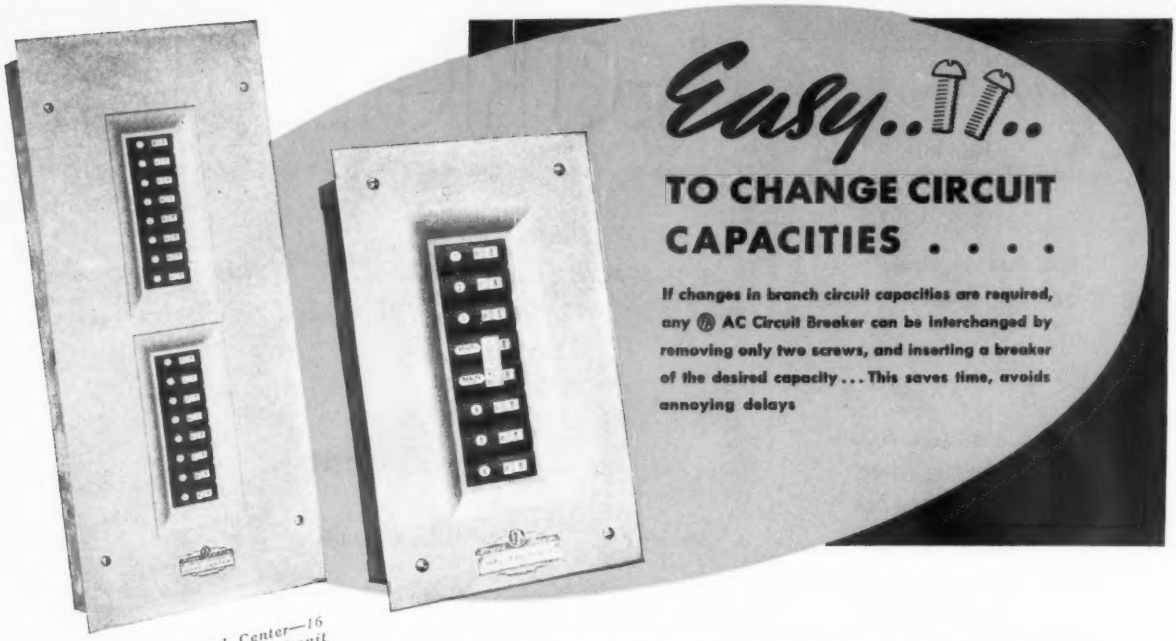
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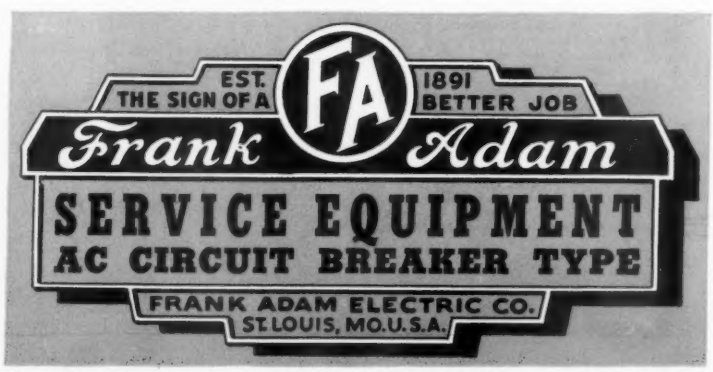


ELECTRICAL SOUTH

OCTOBER, 1939

Dealer Problems and Trends Disclosed in

Merchandising Survey

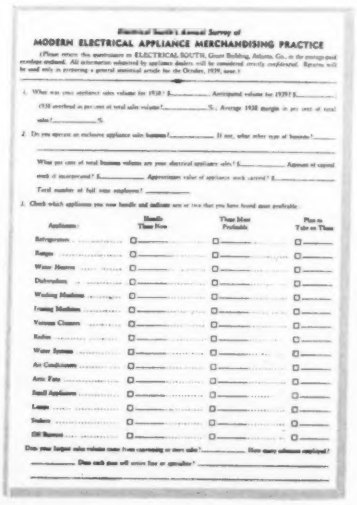
THE difficulty of meeting price competition of unscrupulous dealers who use "long trade-ins" as a means of discounting standard list prices; of building a competent specialty sales organization in the face of continually reduced list prices and margins; of maintaining satisfactory volume with an ever increasing number of retail outlets: these are a few of the serious problems facing the electrical merchandising trade, according to a survey just completed by ELECTRICAL SOUTH.

The results of this survey, discussed in following paragraphs, are based on replies received to comprehensive questionnaires mailed out to 700 appliance dealers throughout the sixteen southern and southwestern states from Maryland to Texas.

The questionnaire was mailed to dealers selected at random from the ELECTRICAL SOUTH subscription list. In preparing these lists, an effort was made to keep the number mailed in each state somewhat proportional to the number of retail outlets in that state. Also, the list was selected with the idea of keeping various groups represented proportionately such as independent exclusive appliance dealers, combination electrical contractor-dealers, and outlets combined with other types of business such as hardware, furniture, and department stores.

Despite the observance of these proportionality factors in the distribution of the questionnaires, a study of the replies indicates that the larger dealers have replied in greater number than the smaller dealers. This was to be expected to some extent, of course, in a survey based on voluntary replies, and due weight should be given to this fact in considering the average figures developed from the replies. In effect, such averages represent a cross section of the more substantial dealers rather than an average for the industry as a whole such as would be obtained from a complete census or a scientific sampling.

The average appliance sales volume reported for the year 1938 was $53,400. An average of the anticipated volume for 1939 for all dealers replying was $59,200



Electrical South's Annual Survey of

MODERN ELECTRICAL APPLIANCE MERCHANDISING PRACTICE

(Please return this questionnaire to ELECTRICAL SOUTH, Grant Building, Atlanta, Ga., in the enclosed envelope endorsed. All information submitted by appliance dealers will be considered strictly confidential. Reports will be used only in preparing a general statistical article for the October, 1939, issue.)

1. What was your appliance sales volume for 1938? $..... Anticipated volume for 1939? $.....
1938 overhead as per cent of total sales volume?..... %. Average 1938 margin as per cent of total sales?..... %

2. Do you operate an exclusive appliance sales business?..... If not, what other type of business?.....
What per cent of total business volume are your electrical appliance sales? %..... Appraisal of capital stock if incorporated? $..... Approximate value of appliance stock carried? $.....
Total number of full time employees? .....

3. Check which appliances you now handle and indicate sets or lines that you have found most profitable.

Appliances	Handle These Now	These Most Profitable	Plan to Take on These
Refrigerators	☐	☐	☐
Ranges	☐	☐	☐
Water Heaters	☐	☐	☐
Dishwashers	☐	☐	☐
Washing Machines	☐	☐	☐
Ironing Machines	☐	☐	☐
Vacuum Cleaners	☐	☐	☐
Radios	☐	☐	☐
Water Systems	☐	☐	☐
Air Conditioners	☐	☐	☐
Attic Fans	☐	☐	☐
Small Appliances	☐	☐	☐
Lamps	☐	☐	☐
Toasters	☐	☐	☐
Oil Burners	☐	☐	☐

Does your largest sales volume come from canvassing or store sales?..... How many salesmen employed?.....
..... Does each plan sell entire line or specialties?.....

representing an increase in sales over 1938 of about 11%. However, in separating replies in which an increase in volume was anticipated for 1939 over 1938, it was found that 88% of the dealers replying expected increases in appliance sales volume for 1939 over 1938 averaging 24.8%. Twelve per cent of the dealers replying expected a reduction in volume for 1939 over 1938, the average for this group being a decrease in volume of 29%.

The average 1938 margin in per cent of total sales reported by dealers was 34.0%. Overhead reported in per cent of total sales volume for the same year amounted to 28.5%. These average figures would leave an apparent spread of 5.5% between overhead and gross margin. Accepted at its face value, this spread between total overhead and gross margin would appear to be satisfactory, especially in view of the fact that total sales volume was relatively low in 1938. However, it would appear that these figures do not reflect losses sustained by the dealer in connection with the resale of merchandise accepted in trade. This would bear out the comment of many dealers, who replied most vehemently, in answering a later question as to whether or not present appliance margins are satisfactory, that present margins would be satisfactory only if list prices could be maintained and trade-ins held down to actual value of merchan-

dise accepted in trade.

The average appliance stock carried by reporting dealers was $6,400. With an average total sales volume of $53,400, it would appear that the average appliance stock is turned over approximately 5.5 times per year. (Stock turn is figured on cost of merchandise, rather than selling price).

Many Exclusive Dealers

Replies to the questionnaire would indicate that there are still an appreciable number of exclusive retail appliance firms in existence in spite of the tendency to combine this type of outlet with other forms of retail business. Approximately 44% of the dealers replying operated exclusive appliance sales firms. The remaining 56% were outlets combined with hardware, furniture, department stores, electrical contracting, and other types of business. The total volume of electrical appliance sales in per cent of total business volume of those firms operating other types of business amounted to an average of 40%, although individual replies ranged from 10% to 75%.

Of particular interest in this survey were the reports of dealers on the types of appliances sold. It would appear that a larger number of dealers are directing their efforts toward the sale of complete lines of household appliances rather than specializing in one or two particular appliances. In the following tabulation is given a list of the more popular appliances and the percentage of replies indicating that these appliances are being stocked and sold:

Ranges	96%
Refrigerators	94%
Washing Machines	94%
Radios	88%
Vacuum Cleaners	82%
Small Appliances	78%
Water Heaters	72%
Ironing Machines	72%
Lamps	64%
Dish Washers	56%
Attic Fans	50%
Water Systems	34%
Air Conditioners	30%
Oil Burners	26%
Stokers	12%

It is especially interesting to note that 94% of the dealers replying handle washing machines, in spite of the widespread belief that this appliance does not have the sales possibilities in the South that it enjoys in other regions. A survey in one large southern city indicates that washing and ironing machines of twenty-three manufacturers are represented in that one city alone, with a total of ninety-two retail outlets. Increasing popularity is also to be observed in the case of attic fans and water systems.

Dealers were also asked to report their most profitable appliances. In answer to this question, 60% named refrigerators as the most profitable; 44% named ranges; 28% named washing machines; 26% named radios; and 14% named water heaters. These percentages do not add up to an even hundred because many dealers reported more than one appliance as their most profitable appliance.

Operating Methods

The general operating methods of appliance dealers were discussed in one group of questions. Replies to these questions indicate that 64% of the dealers are obtaining larger sales volume from canvassing operations than from direct store sales. The average number of salesmen employed by reporting dealers was five, but sufficient details about these men were not given to determine whether they were all full-time men or, in some cases, part-time employees. Dividing the average appliance sales volume of $53,400 by the number of salesmen, it would appear that the average annual volume per salesman is a little more than $10,000.

Appliance dealers, apparently, have practically eliminated specialization on the part of salesmen. Ninety-one per cent of the dealers replying indicated that all of their salesmen sell their entire line of household appliances. Many of the dealers composing the remaining 9% reported specilization only in the case of certain appliances such as stokers, oil burners, heating equipment, etc.

Remunerating Salesmen

By far the most popular method of remunerating salesmen is on the straight commission basis, which was reported by 68% of the dealers. Small salaries and commissions were reported by 23% of the dealers but sufficient details were not given to draw any conclusion as to the average amount of salary and commission. Only 9% of the dealers reported having salesmen operating on a straight salary basis. By far the largest number of dealers replying indicated that their salesmen are paid a straight 10% commission. A few reported commissions as high as 12%.

Fifteen per cent of the dealers indicated that special plans were in effect providing bonus payments for salesmen doing good work. For example, one dealer gives an extra one per cent on total sales volume to all salesmen making their quota for the month. Another dealer gives salesmen an extra five per cent on all sales volume over the monthly quota. Some dealers provide larger commissions on certain appliances; in one case 12½% was given for home laundry and range sales whereas only 10% was given on other appliances. Several dealers reported having head floor salesmen or sales managers receiving salaries plus a small percentage of total sales volume.

The majority of appliance dealers no longer handle their own credit paper. Approximately 57% of those replying stated that they handle no part of their paper; 10% finance a part of it themselves; and 33% finance all of their credit sales. The most popular credit terms reported included a 10% down payment with 30 months for the unpaid balance on most major appliances. This particular arrangement was as popular with dealers handling their own paper as it was with those making use of finance company service.

In general, it does not appear

that dealers financing their own credit sales are any more lenient so far as terms are concerned than those making use of finance company services. Several dealers reported minimum payments of from $5 to $7 regardless of the amount of the sale, and one substantial dealer reported that the down payment is eliminated if a customer's credit is good.

In answer to the question "What percentage of total sales are for cash?" a variety of answers were received ranging from 1% to 40%. A numerical average of these answers was 15%, but it is quite possible that many dealers, in answering this question, included cash received from down payments as well as the volume of appliances sold entirely for cash.

Service Problems

More than 90% of the reporting dealers indicated that they operated their own service department. The remaining 10% made use of service facilities available from local utility companies, distributors, or exclusive appliance service firms in their vicinity.

In connection with the appliance service problem, dealers were asked whether or not in their opinion the availability of appliance service through distributors and other sources would tend to develop sub-standard dealers. Most dealers indicated that good service was one of their strongest selling points and that when similar service was available to small dealers through distributors and other sources, it gave them an advantage out of proportion to their stock, sales volume, and resources. Only 62% of the dealers replying to the questionnaire indicated their point of view on this question, but 61% of these replied that they did believe such service would tend to develop sub-standard dealers.

Discussing methods of promoting business, 64% of the dealers indicated that newspaper advertising was their most effective advertising medium. 18% of the dealers indicated radio as being most effective, and 14% indicated direct mail as being particularly effective. Approximately 10% of the dealers replying indicated other methods as being particularly effective such as hand bills, theater advertising, telephone advertising, stunts, fair booths, unusual point of sale displays, and literature distribution.

Nearly 17% of the dealers replying indicated that they were promoting some business through the use of salesmen employed for "cold canvassing" alone. About half of these dealers were remunerating such men on a straight commission basis while the other half were paying a small salary supplemented with small commissions on all sales closed from leads turned in as a result of the canvassing.

As examples of these "cold canvassing" operations, one dealer reported that he was using five junior salesmen, paying them at the rate of $1 per day plus 4% on all sales resulting from their leads. Another dealer has a group of salesmen to whom he pays 10% on deals they close and 4% on deals closed from leads they supply.

Dealers located in the area served at TVA electrical rates were asked whether they had experienced any increase in sales as a result of low rates alone. Most dealers in this area were enthusiastic about opportunities for appliance sales but nearly all agreed that low rates alone had not produced any considerable increase in volume. Many of them pointed out, however, that the low rates provided a valuable sales story which would produce more volume if backed with aggressive sales effort. Here are a few quotations from dealers in this territory:

"In TVA area, business is very good. Great boom to consumer and dealer alike."

"We have seen a great upsurge in farm and town patronage due to TVA rates—best thing that ever happened here."

"We have enjoyed a considerable increase in sales since TVA rates went into effect."

Another question put to dealers related to sales assistance in the way of advertising, display material, etc., given them by jobbers or manufacturers. Dealers were asked whether they needed more material and assistance of this kind. 88% of the dealers replied that they could use additional material of this kind advantageously. The remaining 12% either answered no or replied that present assistance of this kind was ample.

To the question "Are resale prices generally maintained in your locality?" dealers were about evenly divided in their replies, 47% reporting "yes" and 53% reporting "no." This would indicate that the matter of maintaining prices is more or less of a local problem and one that has been solved in some localities. It was interesting to note that in the case of larger cities where several replies were available from a single city, dealers were more or less in accord with one another in their replies. In one such large city nearly every dealer reported that prices were not being maintained generally. In two other large cities where local appliance dealer associations are known to have had considerable effect in improving business ethics, dealers all reported that prices were being maintained locally.

Associations Helpful

Dealers were also asked if there was an electrical league or other similar association in their locality that admits appliance dealers to membership and whether such an association is producing any results toward increased sales and better business ethics. 75% of the dealers replied that no such associations were in existence in their locality while 25% reported that some sort of an association did exist. Of the latter group, almost 90% were enthusiastic about their association so far as better business ethics were concerned but none of them indicated that the association had been helpful in producing greater sales volume through cooperative advertising or other activities. Several dealers in this group, however, pointed out that more profit was available from existing business as a result of improved business

ethics and the elimination of such practices as price cutting, "long" trade-ins, etc.

In discussing the matter of better business ethics and maintenance of resale prices, one dealer pointed out that apartment house deals in his locality had been closed for cost plus 2%.

Another dealer reported that prices were being maintained on the more acceptable lines but not on second-grade merchandise.

Another dealer said, "Anybody with cash in this town can buy a refrigerator at the same price we can."

"Resale prices are maintained among large dealers," replied one dealer, "but small firms carrying appliances as side lines have been cutting prices to the limit."

Another dealer says, "Trade-ins are used here as an excuse to discount prices where the merchandise traded in is practically worthless."

Dealers were asked if "courtesy sales" at wholesale prices to industrial employees or other consumers are a troublesome problem in their communities. Again, the replies to this question were very evenly divided with exactly 50% replying "yes" and 50% replying "no." Replies to this question were studied carefully to determine whether or not there was any great variation in answers given by dealers located in large and small towns. In larger cities, the number of dealers answering this question in the affirmative were just about equal to the number answering it negatively. In the case of smaller towns, however, nearly three times as many dealers answered affirmatively.

"Margins satisfactory, but—"

To the question "Do you find present appliance margins satisfactory?" dealers were again more or less evenly divided in their answers. 55% of those replying answered "yes" and the remaining 45% replied "no." In both affirmative and negative answers there were many replies conditionalized by special remarks. For example, many of those who replied that present margins are satisfactory, based their reply on the assumption that list prices are maintained locally.

In checking the individual replies to this question with corresponding replies to the question inquiring whether retail prices are generally maintained, it was interesting to note that nearly every dealer who reported present margins satisfactory, also reported that retail prices were generally maintained in his locality. Likewise, dealers who found present margins unsatisfactory represented, for the most part, dealers among the 53% who reported that retail prices were not being maintained in their localities.

Several dealers reported that present markets were satisfactory on all appliances except refrigerators and radios.

One dealer reported "No. Too much volume is necessary under present market conditions. Competitive practices make it impossible to maintain margins and get sufficient volume."

"No. On manufacturers' schedules, dealers are expected to realize 5% to 7% net," reports another dealer, "but high overhead and sales expenses, especially in the case of larger dealers, make them lucky if they make 3% net."

"Too small," says another dealer. "Good salesmen need 15% or higher commissions because of new low lists but present margin will not provide them."

Utility Policies Studied

Because of the importance of electric utility company merchandising practices on the activities of independent electrical appliances dealers, a study of utility company sales promotion activities was included in this survey.

The activities of 36 major companies, serving 2,186,131 residential customers, were studied. These companies serve considerably more than half of the total number of residential customers in the southern states.

No effort was made in this survey, however, to determine policies in municipally owned systems in Tennessee because of the short time that many of these systems have been in operation under new management and because all policies probably have not yet been adopted on a permanent basis.

In the following paragraphs, the percentage figures quoted represent not the number of companies replying to the merchandising questionnaire, but the percentage of residential customers affected by the particular practice under discussion. This method of evaluating the extent to which certain policies are followed provides what might be considered a weighted average since it takes into account, more or less, the size of the company and the number of customers affected by its policy.

Companies serving 90.9% of the 2,186,131 residential customers covered in this survey were found to be operating sales promotion departments offering some form of cooperation to local appliance dealers. The form of cooperation varies, of course, from a limited amount of promotional advertising and the distribution of prospect lists to very intensive sales helps on a large scale.

Only a few companies, serving 16.9% of residential customers, now finance dealers' credit sales. Some of these companies limit this service to small amounts. For example, one company finances sales up to $25. Other companies in this group finance dealers' sales only during special campaigns.

Utility companies serving 38.6% of the total number of residential customers were found to have a policy of collecting dealer installment accounts along with electric service bills. This group included practically all of the companies who finance dealer credit sales.

Only three companies serving 5.5% of the total number of residential customers provide free range or water heater installation on dealer sales of these appliances. One of these companies does not supply plumbing connections. However, twelve companies serving 34.4% of the total number of residential customers, were found to provide at least a part of the range and water heater installations on dealer sales. This participation ranges from merely supplying main line switch up to more than one-half of the cost of the installation. One company reported that it provides free installation during special cam paigns. Companies serving the remaining 60.1% of the customers do not share any part of the cost of installation.

Companies serving 28.2% of the total number of domestic customers indicated in their replies that they provided appliance service for dealers on some basis. There was considerable variation in their methods of charging for service:

"$3.00 per range for first year with dealer supplying all parts."

(*Continued on page* 18)

Dealers Discuss Trade Problems

"The chief need of appliance dealers is for a longer margin, or longer discount, due to the fact that selling costs are becoming greater each year. The list price of a good many major appliances has been reduced; while the dealer's discount has not been reduced, the loss in gross naturally reacts more to his disadvantage than that of the manufacturer, since his unit sales cost cannot be varied to fit the change in list price. Aside from the salesman's commission, none of the factors in selling expense are variable with the list price; it costs as much, really, to sell a refrigerator for $179.50 as to sell one for $250.00, when shipping, delivery, installation, warehousing, advertising, administration and the other factors are taken into consideration.

"Saturation, too, contributes to this condition, since nearly every deal on a major appliance today involves some sort of trade-in. That means that the dealer has either to junk the trade-in, or pay an extra commission to a salesman for selling it, which adds to the mounting sales expense. New factors are arising, too, such as cheaper appliances being sold in districts served by the T.V.A. While we do not have T.V.A. power here, people here can go to some cities and find ranges and water heaters marked down below our cost, due to the advantage of cheaper power. With all these influences to fight, a dealer needs a margin that will permit him to play with the tide of trade in order to come out in the long run."

●

"Attaining a volume necessary to supporting a good sales organization is our chief problem, since, as appliance selling has become so highly competitive, really hard hitting sales methods are necessary. To do this, we need a large force of well trained men, who must be able to make good money in return for their work and training. At present dealer discounts, we have to sell about 30% more merchandise than I would consider a normal quota for this size sales force in order to come out with any profit. This means gearing up the sales operation more, which in turn means more expense, and the result is a vicious circle.

"What we need is a discount from the manufacturers which would allow us to actually sell on a margin of 35%, without having to absorb all our overhead out of that discount. The sales expense, repossession loss, and trade-in losses will eat up a 35% discount quickly enough, without all the other inroads that administration and overhead make on our margin."

●

"The day of the big appliance dealer is about over. The low margin plus high sales cost and replacement allowance make it impossible to break even. Due to the high cost of reconditioning used refrigerators and easy terms allowed by furniture and department stores, we can't come out on trade-ins."

●

"The attitude of the utility in sales promotion, both for itself and for the independent dealer, is curious, in that, admittedly, their ultimate gain lies in increased electric consumption, yet they fight tooth and nail for individual appliance orders, meanwhile supposedly cooperating with the dealers with the other hand. It's a case of wanting the cake and eating it too. New men have been hired by the utility for the purpose of appliance sales and canvass, and they make their appliance merchandising department support itself, in doing a volume sales job.

"Their superior position, in knowing who has what appliances and getting leads from their meter readers, enables them to lick the spots off any independent dealer, which they do, yet they try to be the dealers' friend at the same time, and are actually of some assistance in some ways. They encourage the dealers' sales, offer bonuses and sales promotional assistance, give them breaks on installation and assistance in some cases on financing, and then take the deal away from the dealer if they can.

"The point is that they want lots of appliances sold, but they want to sell most of them, and there is no justice in their receiving the ultimate benefit of the increased load and the profit on the appliance sale too. Utilities should maintain a sales promotion department to function for the dealers, helping them to do the sales job.

"In the final analysis, they'd get their increase all right, and they wouldn't have the appliance merchandising department to support, so their salesmen would then be working for other dealers, and everything would be the same except that the dealer would make more money."

●

"The big fly in the appliance ointment here is the matter of 'courtesy sales' to industrial consumers and others at wholesale prices. Requests for discounts come thick and fast, as the city is headquarters for thousands of federal employees and state employees as well, all of whom seem to feel that they are entitled to some sort of 'break' on list prices of appliances.

"Many times a state employee will get hold of a state purchase order, and fill it out for whatever appliances he wants, getting them at the discounts extended to the state. Incidentally, we see no

SPACE was provided on the questionnaire blanks of this survey for dealers to write in any comment they might care to make for publication on problems of current interest to the trade. Several of these discussions are reproduced here.

reason why the state should pay less than the consumer for industrial goods, as they're spending the consumer's money. If dealers don't play ball with discount hunters from the state house, they find that many distributors will, and in addition they find themselves shut off from some branches of state purchases which are somewhat profitable. Since discounts are none too long as it is, by the time about half your gross profit has been whacked off half your total sales as a result of these handout discounts, it is easy to see why the business is a tough one here.

"To eliminate it, it should be made a penal offense for any state or federal employee to seek a discount due to his position, and it should be further enacted that governmental agencies are entitled to discounts only in ratio to quantities purchased such as are available to any dealer or wholesaler. This, plus a good, tight appliance dealers' association, might turn the trick."

●

"Something should be done to improve the conditions of small appliance dealers. In our territory there are too many who have gone broke in spite of hard work and big turn over.

"One thing which is hurting the business is the practice of some large companies of building equipment almost identical to their first line and selling it through mail order or other semi-direct sale channels at a very much lower price."

●

"Utility competition is our most serious difficulty here. The light and power company competes actively with independent merchandisers in selling appliances, primarily for load building purposes, of course, but instead of realizing that units sold by independent dealers also build their load, they do not cooperate with local dealers, but go after the business in active competition. Naturally, in anticipation of future electric consumption, they can afford to whittle profit margins on appliances down to the bone, which they do.

"The major appliances, refrigerators, washers and ranges, are the backbone of all small appliance dealers' volume; when the utility works out an elaborate trade in offer, giving a high allowance on some worn out range or ice box, which no dealer could hope to turn over to rescue his profit if he gave a like allowance, they are really doing nothing more or less than giving a fantastic rebate, which should not be permitted, yet, who is to do anything about it? The manufacturers cannot kick, since the utility sells plenty of goods for them.

"The only way the independent merchant can fairly compete with the utility, even considering its superior financial position and backing, is for trade-ins to be established by law and maintained like list prices are supposed to be. A trade-in code book on used appliances should be worked out, such as is used on used car deals, and the scale set up should apply to every appliance merchandising operation."

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"The cancer of the appliance business is the failure of distributors to clamp down on dealers as regards fair prices. In this city, we have but one wholesaler who forces his retailers to toe the line in maintaining the list price level, and who maintains his own wholesale prices. There are other distributors who sell indiscriminately at discounts as much as 20% over the normal levels, to anyone who can pay cash.

"This failure of the jobbers to keep faith with the dealers has resulted in the springing up of a lot of side line dealers, who handle one or two appliances along with their regular merchandise, at no overhead cost at all, either in housing or in sales force. Automobile dealers are carrying appliances, radios and washers, and make no secret of the fact that they will cut the price 'way under' to make a quick cash turnover.

"Also growing out of the practice of jobber-furnished service is a bunch of sub-standard dealers with a hole in the wall store and little stock who cut price drastically just to keep their dollar turning over. The finance companies are tough about whose paper they will discount; why don't the jobbers take a lead from them and be tough about to whom they give their franchise? The little dealers haven't the stability to qualify for credit with the major finance companies, and have to turn over their goods for cash; that keeps them scrambling for cut-price cash deals, and list prices go out the window.

"All in all, there are too many manufacturers, too many distributors, too many retailers. As long as the manufacturers are greedy for volume, of any sort at any price, there will be the fly-by-night distributor who will put his line in any coal yard that can buy one unit, without regard to price maintenance or trade practices."

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"I believe there should be a uniform rating made on all refrigerators for the purpose of trading. This of course would have to be enforced by the distributors and dealers and a problem would result. However, if such a system could be worked, I think it would eliminate a great deal of shopping by the prospective purchaser."

●

"Since electrical appliances are merchandised through small retail outlets, the majority of whom are operating on a small investment, the manufacturers obviously have to do a lot in preparing sales helps and promotions for retailers handling their lines.

"However, they seem to overlook this fact that one good hardworking outside salesman is worth all the display material they can give a dealer. A dealer needs a salesman who will track down leads that he gets through his grocer, his laundry man, his neighbor, anyone. All good leads don't originate through advertising and canned promotions; many of them just happen along, or come by the grapevine. The salesman has to really work, on the street and in the home, to do a good job.

"Such salesmen are hard to find. That's where we need the distributors' and manufacturers' help, in finding and training good retail salesmen. If they would spend half the money on this work that they spend on printing and lithographing, and have a department working on lining up and training good salesmen all the time, it would double the business of the retail dealer."

Commercial Cooking Activity Described in Report

THE thirteenth annual survey of sales of Commercial Electric Cooking Equipment, covering the year 1938, has just been released by the Commercial Electric Cooking Council, according to an announcement by P. M. Alden, the Council's chairman.

The survey, compiled by means of questionnaires, covers 128 electric utility companies, the largest number that has ever contributed to it. A study of the results brought about by the sales and promotional efforts of these companies provides convincing evidence of the profit possibilities from this type of load-building equipment.

The survey has been divided into two parts, one of which includes data on total commercial customers, number of food-serving establishments, kilowatts sold, estimated kilowatt hours, estimated annual revenue and estimated increase in annual revenue. An analysis of this data is given in the accompanying tabulation.

The second part of the survey included data on salesmen, wiring policy, equipment financing, equipment servicing, future sales plans, and Council tie-in. Excerpts from this part of the Council's report follow:

Personnel and Their Activities

Seven companies reported the use of full-time commercial cooking salesmen only, twenty-one companies reported the use of full-time and part time salesmen, ninety-eight companies reported the use of only part-time salesmen, and eight companies report that they have no salesmen contacting the commercial cooking field.

In the companies that use full-time salesmen for the promotion of this type of business, these specialists averaged $8,660 in E.A.R. per man per year. This was equivalent to an average of $11,135 per company. The eight companies that reported they did not have salesmen covering this field did a certain amount of business in commercial electric cooking equipment through purchase by the customers upon their own initiative. These companies averaged only $1,275 in E.A.R. per company through these unsolicited sales. It appears that the use of one full-time salesman, or even a part-time salesman, would be well within the budgeted development expense in view of the high E.A.R. derived from this business.

Other activities of part-time salesmen are reported in the summary. These part-time men devote on the average 16.4% of their time to the development of the commercial electric cooking load.

Since the Council program is designed to promote the sale and use of electric counter and pantry type equipment, it is interesting to note that those companies reporting on the division of 1938 sales, estimate that 73.0% of last year's sales were of this type.

Wiring-in Cost

Fifty-one companies report they do nothing to offset the cost of wiring, fifty-two allow from $3.50 to $6.00 per kilowatt connected up to certain limits, and one company has an allowance based on the E.A.R. of the equipment. Twelve companies furnish wiring plans, four companies report that the cost of wiring is included in the selling price, three companies sometimes finance the wiring and one company supplies the switch on electric range sales only.

It is interesting to note that last year 52% of the reporting companies did nothing to offset wiring cost of electrical operation while only 42.5% of the reporting companies this year report they do nothing. While only 37% of last year's reporting companies paid a wiring allowance, 43.3% of this year's companies are now paying an allowance. The trend appears to be toward giving wiring allowances in producing this class of business, and when consideration is given to the load-building value of commercial electric cooking equipment, this is undoubtedly an excellent means of obtaining a larger share of this profitable business.

Financing Arrangements

In reply to the question "Do you finance equipment sales?" sixty-five companies reported "yes," nine companies reported "some," fifty-two reported "no" and only two companies did not reply.

In reply to the question "Who Services Equipment?" there were 126 answers and these are tabulated below:

(*Continued on page* 19)

Analysis of Commercial Cooking Council Questionnaire Returns on 1938 Promotional Activities

Group A—Summary of All Replies

Total number of electric customers served, excluding domestic, municipal and utilities	2,178,521
Approximate number of food serving establishments in territory served	131,363
Kilowatts of commercial electric cooking equipment sold	65,101
Estimated kilowatt-hours to be used annually by this equipment	70,628,113
Estimated annual revenue from this equipment	$1,579,401
Net increase in revenue over previous year	$156,245

Group B—Summary of Complete Replies Only

Total number of electric customers served, excluding domestic, municipal and utilities	1,846,262
Approximate number of food-serving establishments in territory served	120,977
Per cent of food-serving establishments to total number of customers shown above	6.55
Kilowatts of commercial electric cooking equipment sold	50,774
Watts sold per food-serving establishment (average)	420
Estimated annual kilowatt-hours used by this equipment	58,432,941
Estimated annual kilowatt-hour use per kilowatt connected	1,151
Estimated annual revenue from this equipment	$1,308,929
Estimated annual revenue per kilowatt connected	$25.78
Net increase in revenue over previous year	$160,659

Dramatic Demonstrations

A New Technique in Selling Appliances

By John M. Goodwin

"He floats through the air . . ." but its not acrobatics, just part of a well established method of demonstrating electrical appliances through "dramatics" rather than words alone. The average prospect may not attach much importance to door strength but this demonstration leaves her with a vivid impression of general durability.

MERCHANDISING practice, like everything else, has come a long way in our time. Not so many years ago the cardinal principle of successful merchandising was to *have* the goods—nothing else seemed to matter very much. Then came the era when the contemporary exponents of advanced methods said, "Let them *see* the goods."

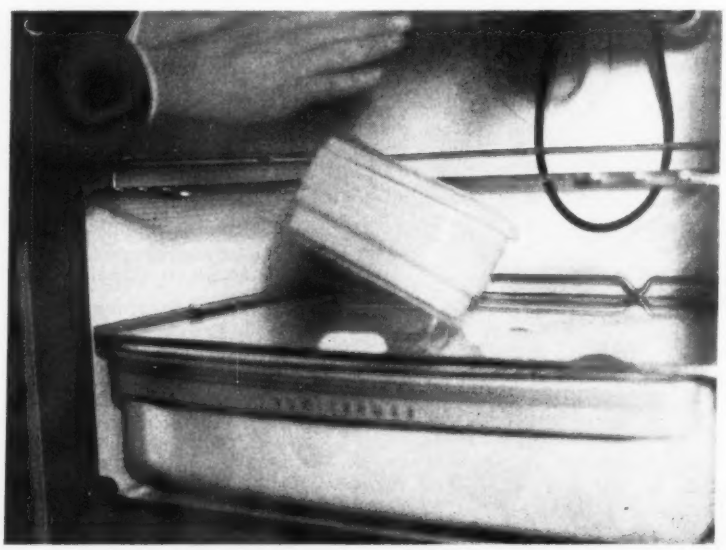
As the wisdom of this became apparent the in-tune-with-the-times boys went a step further and advocated that merchants *make* their patrons see the merchandise, put it out where it would have to be seen, and in attractive surroundings. Soon they advocated that we not only let prospective buyers see the merchandise but let them see how it works—demonstrate it.

Each of these stages in the development of the merchandising art was in its time "the last word." Demonstration has for some time been recognized as a most potent selling device. But now they tell us, and we think they are right, that simple demonstration of merchandise is not enough—that demonstration must be superseded by *dramatic* demonstration of the spectacular sort which is packed with showmanship and selling punch. If demonstration is effective, dramatize it and make it better.

They say that if a picture is worth a thousand words, a demonstration is worth a thousand pictures—and to carry it a step further, a dramatic demonstration may be worth a thousand demonstrations.

Here's the difference between what we call demonstration and what we mean when we say dramatic demonstration: Suppose a salesman is discussing with his prospects the construction of a refrigerator, and of the door in particular. He opens the door and points out the thickness of it. He tells them about the heavy gauge steel and the durability of other materials in the door. He may ask them to feel the door or tap on it to get the impression of solidity which exemplifies strength and quality. He will tell them how the strong hinges will keep the door from sagging, thus preventing it from getting out of line and making a poor seal when closed. He is demonstrating.

Another salesman brings his customers up, opens the door of the refrigerator. Then he shows them a sample corner cut from an actual door, enabling them to see a cross-section of the actual door construction. Then he says, "This door will never sag or warp. It is well built. It is tough, and it can take it. Look!" With that, he swings a specially designed chair (seen in an accompanying



Instead of merely telling the prospect that this glass top is tough, will not be broken easily by accidents, a Peasant ware dish is dropped on top of the glass without mishap. (Photos courtesy Westinghouse Co.)

Walk up to the door with both hands filled and open it easily. This is more convincing than volumes of oratory on the convenience of the special patented latch. Give the scuff plate an actual kick, such as it will be subjected to many times during the routine day. More than anything that can be said, this makes the housewife appreciate that scuff plate.

photograph) over the top of the door, hops into the chair and swings back and forth on the door. He has dramatized his demonstration.

Need he say more about the construction or durability of that refrigerator door? Definitely, no. (That is, if the door doesn't fall off).

The prospects may remember little of what the first salesman had told them, but they will never forget the picture of the big hulk of the second salesman swinging on that refrigerator door.

Another good example of dramatization: A leading pharmaceutical house has for some time been demonstrating the purity and uniformity of their aspirin tablets by showing the rapidity and completeness of their disintegration when dropped into a glass of water. The druggist or the doctor, who would be the customer in this case, would see the aspirin tablet lay on the bottom of the glass and dissolve. Somebody in their organization devised a simple way to increase the effectiveness of this illustration by making it more dramatic. They put a screen wire grating in the glass about halfway down so that it would catch the aspirin tablet which was dropped into the glass but would allow the disintegrated particles to fall through to the bottom. Thus the observer now sees not a tablet which simply dissolves while laying on the bottom of the glass, but he sees thousands of tiny particles leave the tablet which rests on the grating and fall rapidly through the water toward the bottom. It is more spectacular, and the motion or action of the falling particles gives the effect of quicker disintegration.

A manufacturer of bearings dramatizes his sales story of minimizing friction through a display in which a giant wheel weighing more than a ton is turned by the wind stream from an average size electric fan.

People like the spectacular, the dramatic, the unusual. It impresses them and they remember it.

No Expense Involved

It is not always necessary to spend money and time in order to stage dramatic demonstrations. There must be many ways in which every salesman can inject a little of the dramatic element into his selling practice, not only on refrigerators or on any other one line, but on all of them. With a little thought and some ingenuity he may be able to devise a number of little "tricks" which will enliven and dramatize his sales presentation.

A simple illustration of this is brought out in one of the accompanying photographs. Instead of merely calling the prospect's attention to the scuff plate at the bottom of the refrigerator, this salesman walks over and kicks it violently, dramatizing the fact that the scuff plate will protect the porcelain and help the housewife to keep the box clean and shining.

Nearly every feature of any appliance can be dramatically demonstrated. In another illustration at the top of a page a salesman demonstrates the new "easy opening" latch. He approaches the box with his arms loaded; with a simple twist of his elbow he opens the box and convinces his prospect of this feature in quick easy way.

There are dozens of such demonstrations—dramatic demonstrations—that any salesman can develop; simple but tremendously effective. He can demonstrate the capacity of receptacles by actually pouring a quart of milk or water from a bottle. The powerful release mechanism on ice cube trays can be demonstrated by having another salesman stand on the tray and then lift him easily as the release lever is depressed.

The salesman who punctuates his sales story with such demonstrations will not fail to get his message across and make it stick.

Testimonial Advertising

Used Effectively in a Merchandising Campaign

JACK LACEY, advertising manager of the Tampa Electric Company whose advertising campaign recently won an award of merit from the Public Utilities Advertising Association, is a former newspaper man and has been with the Tampa utility company for seven years.

For his company he has developed one of the best institutional advertising and sales programs in the country, including establishment of "Leisure House" for electric cooking demonstrations.

He was one of the first to give a masculine slant to a kitchen, his latest endeavor after gaining national recognition with women's testimonials. He tells all about it in the accompanying story.

THE Tampa Electric Company of Tampa, Fla., recently was given an award of merit for its merchandising advertising by the Public Utilities Advertising Association, and it won the honor with the simplest and one of the oldest promotion methods known: getting customers' names into the newspapers with testimonials.

In fact, it was so simple that copy writers of many of the 249 electric companies participating in the contest were amazed. It was hardly believable, but testimonial advertising has been used since the days of Sapolio, and it is still effective.

Tampa Electric began its use in October, 1938, at the beginning of a new season when a new idea was needed to provide a different, more personal approach to its advertising and sales. In the past its advertising had created desire for electric equipment and all-electric homes, but it had not chased away that bugaboo of all power companies, the fear of high rates.

This sales resistance always had been a problem to us, especially on kitchen equipment. Salesmen had been able to sell everything about all-electric service but its cost. The compnay had done all sorts of educational and institutional advertising about rates, but the trouble was it could not be specific like it could about the price of butter and eggs.

Electricity is sold at so much a kilowatt-hour, and a kilowatt-hour was a deep mystery to most people. We could advertise that it would operate a 100-watt lamp for 10 hours, but that still did not give accurate information on how much it would cost a particular family to cook electrically. We could say that the more electricity used, the lower the average rate would be, but we could not tell exactly how much Mrs. Smith's bill would be in dollars and cents. Too many different factors entered into it.

So the case was taken to the people, and the first of what became a long series of testimonial advertisements appeared. They were our customers' own stories. The only difference between Tampa Electric's advertising and the usual testimonials, so popular now in cigarette advertising, was that it was a series of simple messages that sound like every day "over the fence" talk and were not composed of snappy phrases and tongue catching slogans.

In each case the customer whose testimonial and picture were used had a hand in preparation of the ad. The statement and headlines were, as near as possible, their own expressions. No ad was ever published until the customer had seen it as it would appear.

Perhaps the greatest question raised in the minds of other utility advertisers who watched the campaign is how Tampa Electric got the names and consent of the users. That was simple, too. No money and no reward of any kind was paid, and it was done in a co-operative spirit. The approach to the customer was based on the idea that the company wanted to show others what could be done in modernizing a kitchen with all-electric service. The customer was told sincerely and truthfully that the company considered her kitchen a good example, and wanted to show it. Women are naturally proud of their kitchens when they have the things they want, and it was easy to get co-operation from the beginning.

A few sidelights on the company's experience during the campaign are interesting. The first ad of the series, telling why the woman was proud of her all-electric kitchen, attracted sufficient attention to show that while this particular ad had its faults, the idea was one to bring results. The day after it was published the woman called and said she had become the object of a joke among her friends who pretended the company had given her the equipment.

"If I had known that," she

snapped, "I would never have let you use my picture in the paper."

But a few days later she called back to say that three women with whom she was unacquainted had called her to ask about electric service. Of course, she had a good word for electric cooking, and the company got at least one sale of a complete electric kitchen from her endorsement.

One of the best features of the idea is that the advertising benefit continues after the ad has been published. Each time an ad is used it is the topic of conversation for days afterward among the friends and neighbors of the customer whose kitchen appears. Any number of sales have been traced directly to what these customers have told others.

One ad told about a woman, 77 years of age, who had just purchased her first electric range. A good old fashioned patent medicine heading was put over it: "—Tampa Woman, 77, Says Electric Cookery Best Ever." I apologized to my friends in the advertising business for the headline, but it was one of the most effective the company has used. The woman sent six copies of her kitchen picture to friends. Two of them bought electric ranges. The woman's statement which she wrote herself said she had been keeping house for more than 50 years and had used every type of cooking fuel, but never had realized what real cooking was until she tried electricity. She advised young housewives to adopt all-electric service from the start.

At right is one of the first advertisements designed to interest men in electric ranges. Other testimonial copy is shown below. All of these are greatly reduced from full-page size.

"BOY - DOES THAT NEW ELECTRIC RANGE GET HOT IN A HURRY!"
LEE TERMINAL
MEN! Can you cook?
Announcing
The masculine contingent takes to the Electric Kitchen
says Mr. Morell
TAMPA ELECTRIC COMPANY

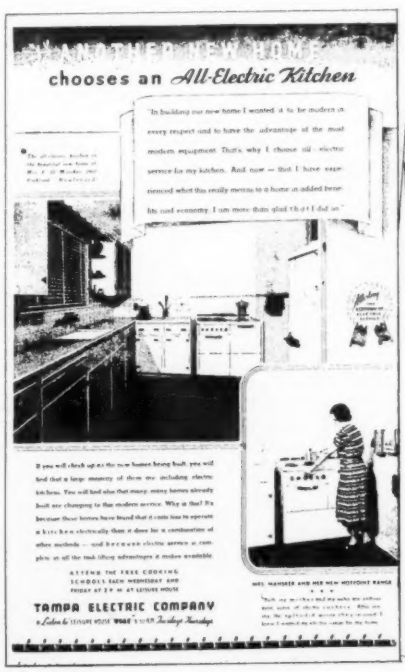
Since the campaign got well under way the company has had no difficulty in getting photographs and statements. Voluntary testimonials are coming in faster than the advertising budget can handle them, and the company is always three or four weeks ahead of publication with material.

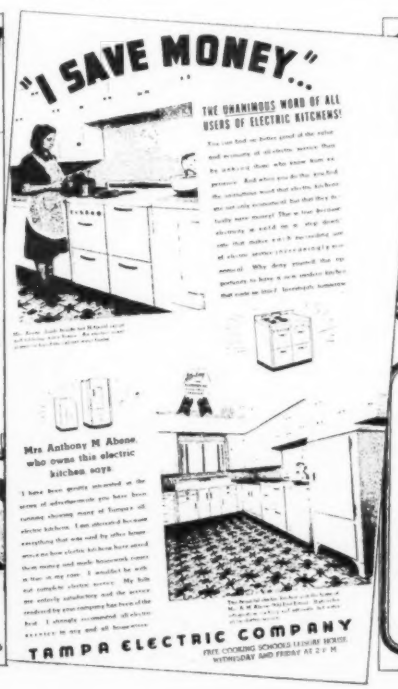
In my opinion, the campaign is by far the best type of advertising the company could be doing because it accomplishes three jobs in one. It is institutional and it develops both load building and merchandise sales.

Another by-product value is that it gives the salesmen something interesting, strictly local and concrete to show to his prospects. Copies of the ads are inserted in loose leaf binders as they appear and have proved to be the best salesmen's portfolio we have ever devised.

No matter what objection the prospect raises, an answer is found in the experiences of other housewives. If it is cost, there are ads by women the prospect either

(*Continued on page* 19)




"I SAVE MONEY..."
THE UNANIMOUS WORD OF ALL USERS OF ELECTRIC KITCHENS!
Mrs Anthony M Abene who owns this electric kitchen, says
TAMPA ELECTRIC COMPANY

Electric Service is my home's biggest bargain!
"I HAVE CONSISTENTLY SAVED MONEY SINCE INSTALLING AN ALL-ELECTRIC KITCHEN"
MRS. M. M. JUSTER
607 W FRANCIS ST. TAMPA
Proof!
EXPERIENCE OF ACTUAL USERS PROVES THE ECONOMY OF ELECTRIC SERVICE
TAMPA ELECTRIC COMPANY

Individual Customer Interviews Feature Sales Programs

AS the trend toward lower rates for electric service continues, utility companies are finding the problem of load building one of ever increasing importance. Many companies are developing sales promotional programs with new low rates as the keynote. While such campaigns have not been unusual in the past, the intensity with which several companies are promoting them at the present time is of particular interest. A special feature of several of these campaigns is direct contact with every customer. The activities of several companies are described in the following short articles.

"Race to Recovery" Campaign Staged in Mississippi

"ELECTRICITY is Cheap" was the keynote in the "Race to Recovery" campaign staged recently by the Mississippi Power and Light Company.

To company employees it was a "Race to Recovery" because of the objective to redeem a $265,000 loss in revenue brought on by a rate reduction in June. This reduction followed by only a few months a previous substantial rate cut. Together these latest reductions will save approximately a half-million dollars for customers on their electric service bills during the coming year as compared with a year ago.

For dealers, jobbers, and manufacturers this cheap electricity campaign was named the "Greatest Opportunity" for appliance sales in Mississippi history, for the rate reduction opens up an additional "plus" market of $5,300,000! In other words, it will be necessary for MP&L customers to buy five-and-a-half million dollars worth of appliances in order to take advantage of the 8,000,000 kilowatt-hours which the reduction makes available at no additional cost.

Campaign details were first presented to distributors and manufacturers' representatives at a meeting featuring talks by Rex I. Brown, president; Henry B. Sargent, vice president in charge of operations; W. A. Moore, vice president in charge of sales; and L. M. Taylor, sales promotion and advertising manager. Similar meetings were conducted later by Mr. Taylor in key cities served by the company.

High spot of the program at these meetings was the "unveiling" of the new rate schedules, symbolized by five large cubes representing the rate steps—beginning at the new low 4 3/4c top step and proceeding downward to the special 1c step for electric water heating. As Mr. Taylor announced the new rates, he drew back the "veil" that had been covering the blocks, and assisted an attractive young lady to step down the blocks, dramatizing the fact that the homemaker can "step up to better living" through the use of more electricity and at the same time "step down to cheap electricity."

Backbone of the campaign was the daily schedule of personal customer-to-customer contacts which were begun by the Mississippi Power and Light Co. sales force immediately following the series of dealer meetings. The company increased its staff of salesmen by eleven men in order that in the three months of the campaign it would be able to contact personally every one of its 43,000 customers to explain the new rates and sell them on taking advantage of cheap electricity by buying new appliances from their dealers.

Salesmen were equipped with residential visualizers, sight meters, etc., and in addition carried contest literature and a special "personal presentation" folder, which was filled out in advance for each customer, showing her how many free kilowatt-hours were available as a result of the rate reduction and what appliances could thus be operated at no additional cost; the major appliances which the customer did not have but which could be enjoyed for only a

L. M. Taylor, sales promotion and advertising manager of Mississippi Power and Light Co., introduced his sales program in this manner: demonstrating that the housewife can "step up to better living" as she "steps down to cheap electricity" through new low rates.

small cost in addition to the free kilowatt-hours available; the low "cost to double" present usage; and a complete service analysis.

The salesman advised with the housewife about her electrical problems and needs and endeavored to sell her on buying additional appliances; these prospects were then turned over to a dealer in the community.

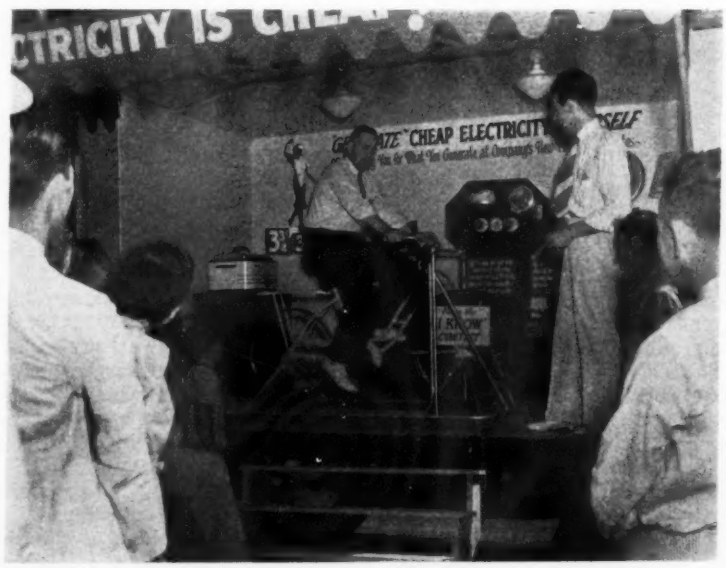
The object of the contest mentioned above was to get every housewife to figure out for herself how cheap electricity really is. Three roasters and six IES lamps were awarded each week for 12 consecutive weeks to the contestants who turn in the best entries completing the sentence, "I know electricity is cheap because . . ." in fifty words or less. The contest was plugged on the company's radio broadcasts, in newspaper ads and in publicity stories. Each week's results furnished excellent opportunities for publicity stories in the newspapers from the towns where the winners live.

One of the most forceful newspaper advertising campaigns in the history of the company was released during the "Race to Recovery." All advertising urged Mr. and Mrs. Mississippi to see their appliance dealer and buy the equipment they need to take full advantage of cheap electricity. Because this theme appeared in all ads, great success was achieved with dealer tie-in advertising. Dealers were sold on the idea that "the utility company sells the service; the dealers sell the appliances."

Cheap electricity was ballyhooed effectively in true old-time medicine show style during the "Race to Recovery." An attractive sound truck made the rounds in the company's territory, dramatically proving that electricity is cheap and urging members of the audience to visit their appliance dealer to buy the equipment that's necessary "For Better Living."

One side of the truck opened up revealing the inside as a stage, on which was a bicycle attached to a generator. Around the walls of the stage were grouped such appliances as a lamp bulb, a toaster, a fan, etc. These were connected to the generator and the public was invited to "Step up and generate electricity—toast a piece of bread, light this lamp—and we'll pay you for your work just as our customers pay us for doing the same jobs." Payment is made to "generating" bicycle riders by cutting one-mill tax tokens with a pair of scissors.

"If you've ever had a hard time convincing someone electricity is cheap," reports Mr. Taylor, "just have them generate half-a-mill worth of electricity on such a bike and they'll be convinced!"



Cheap electricity was ballyhooed in medicine-show style with this exhibit mounted on a truck. The public was invited to try its hand at generating power with the bicycle generator. Customers were convinced of the low price of electricity when few could earn more than a half of a mill, paid to them in tax tokens cut in half.

Appliance Sales Increased by House-to-House Survey

THE prediction of Houston Lighting and Power Company executives that an immediate market in Houston and vicinity for more than a million dollars in electrical appliances and equipment sales awaits aggressive dealers by virtue of the drastic new electric rate reduction, has been amply justified. Tabulations for the utility-sponsored sales campaign for the month of July only, indicate electrical appliance sales of more than $700,000, largely made on the basis of certified sales leads furnished dealers by the Houston Lighting and Power Company. Typical of the comprehensiveness of the campaign is the fact that 3,500 refrigerator prospects were located.

The backbone of the sales drive was an intensive house-to-house survey made by approximately one hundred especially trained employees of the Houston Lighting and Power Company. Their duty was to explain thoroughly the new rates, to leave in each customer's hands a copy of the new dealer directory, which listed under detailed captions the local dealers handling a wide range of electrical appliances; to discuss any equipment in which the customer displayed an interest; and to secure good leads which were turned over to cooperating dealers. This work was at the sole expense of the utility. The value of these leads to the dealers can be determined by the dollar value of appliance sales already mentioned above. The value of the campaign is further emphasized by the fact that sales for the same period last year amounted to only $400,000.

In putting over the campaign, the utility used every advertising medium at its command to publicize both the equipment and the cheapness of the rates. Slogans

H. E. Dorrill, sales promotion supervisor, Houston Lighting and Power Company.

featured were "Electric Rates are Reduced Again," and "Electricity is Cheaper," and an additional $10,000, over and above the regular advertising appropriation, was used to publicize the campaign. Media employed included extra screen broadcasts, 500 additional radio spot announcements, billboards—both poster and paint, truck banners, bill inserts, window cards for both company and dealers, hand-bills, and newspapers.

At the time the survey was made, householders were presented two booklets, the Dealer Directory, mentioned above, and a rate reduction booklet which explains the rates, shows the savings between the old and the new rates, and illustrates the use of the various services the utility sells, together with cost of services. It also outlines briefly the plant, its capacity, construction, etc., together with data showing the ever-increasing upward trend of company operating expense during the preceding 24 year period.

The house-to-house survey interviews were handled somewhat in this manner: The interviewer had a copy of the preceding month's electrical bill for each customer served by the company. And as he interviewed the housewife, he directed attention to that amount; then, referring to the "Cheaper Electricity" chart which he also carried, he showed the consumer just how much free electricity the new rate reduction would allow her—free because the same money would now buy that many more kilowatt-hours than before the June 1939 rate reduction. For example, assuming a total usage of 110 kwh and a bill of $3.84, the saving on the new rate would mean an additional 9 kwh available under the new rate for the same $3.84.

Next the interviewer opened the "Electrical Appliance Dealer Directory" to pages 28 and 29, where a double-page spread, captioned "What the new residential rate means to you," graphically illustrated the possibilities of the new electric rate. It was shown, for instance, that for the hypothetical saving of 9 kwh listed above, the consumer could operate an electric refrigerator for only an average of 60c a month more than she'd been paying under the old rate.

In the event the housewife already had electric refrigeration, 19 other appliances were illustrated, together with the average monthly kwh consumption. As they talked, the interviewer circled in colored pencil the appliances in which the customer evinced an interest. A listing was made of these, and the lead turned over to the dealer best equipped to handle such sales.

At the close of the interview, the canvasser sought to know whether the housewife had any complaints about the service, and whether she had any suggestions.

That the leads so gathered are well worth while is proven by the fact that one dealer closed 29 sales in a week's time from the leads turned over to him. However, in spite of all these advantages, the merchandise does not sell itself. "There is still need for salesmen," said H. E. Dorrill, sales promotion supervisor of the Houston Lighting and Power Company, who worked extensively on the campaign. "A salesman is still required to actually close the deal. A customer will not purchase a major electrical appliance merely because of advertising or promotional efforts. It requires continuous, persistent effort on the part of the dealer, and the harder the salesman works, the more deals he is going to close."

Illustrative of the profitable sales which await the willing worker, Mr. Dorrill pointed out that the first eight days of the survey, covering 14,100 homes, unearthed more than $200,000 in prospective electrical equipment sales.

Sales Promotion Coordinated With Rate Reductions

WHEN the Arkansas Power and Light Company put into effect greatly reduced residential rates in September, it launched simultaneously the most extensive revenue recovery program in its 25-year history.

Faced with a revenue loss of $316,000 if customers took advantage of their savings instead of increasing their consumption, the power company developed a program aimed entirely at boosting its load.

By working for and with the newspapers in its territory, the company succeeded in obtaining the publication in every one of the 17 dailies and 75 weeklies in its territory special sections stressing the increased benefits that the new rate offered at no extra cost.

It was the most extensive advertising tie-in campaigns ever staged in Arkansas.

Thousands of inches of advertising about the new rates, appliances and service, as well as many more thousands of inches of appropriate reading matter were published by these papers, unquestionably making readers more "electric-conscious" than any other one thing in many years.

The new rates for domestic service start at 3½ cents per kwh for the first 100 kilowatt-hours. The second block includes 100 kwh at 3c per kwh, and all energy in excess of 200 kwh is charged for at the rate of 2c per kwh. The customer also pays a small service charge which varies in the different towns served.

Prior to launching the program, the power company entertained distributors and dealers at Couchwood, the country home of Harvey Couch, president of the company, on one of the lakes formed by Arkansas Power and Light Company hydro-electric dams on the Ouachita

river. Here the plans for the entire program were outlined in detail by Max Sudduth, residential sales manager, and J. F. Tuohey, commercial sales manager. They were enthusiastically received and wholehearted support was pledged.

The distributors and dealers were particularly impressed with the revelation that through the reduction about 10,000,000 more kilowatt hours would be available to customers at no increase in cost, and it would take about $7,000,000 worth of additional appliances for the customers to take advantage of these increased benefits.

The utility company will not depend upon advertising alone to tell its customers about the new rate but will reach every one of its 62,378 residential customers through personal contacts. A staff of fourteen specially trained men and women will work for four months on these calls.

Armed with attractive folders that have the dual advantage of making the customer interested in using more kilowatt hours and more appliances, these home contact men and women are obtaining information that is invaluable to home appliance dealers. One of these folders has an electric service check list which tabulates thirty commonly used home appliances. The customer is asked to check off on the list the various appliances already being used. After the customer has checked, the unchecked squares provide a record of appliances not owned.

Another folder that is providing information is the Usage Chart, presented to the user to acquaint her with the typical monthly usage cost of electrical apliances in the ordinary home.

"Prospect Hunters" Effective In Knoxville Campaign

A SPIRIT of fun helped break records and exceed estimates in an electrical appliance sales campaign in Knoxville. Electrical appliance dealers and contractors co-operated with the City of Knoxville Electric Department in what was called a "Man Hunt" sales campaign.

The 90-day campaign was off to a start with a bang when the city salesmen were lined up and then hauled in the city's "Black Maria" to City Court. Safety Director Otto Koehl there commissioned them to go out on the "man hunt."

The sales force then began to scour the countryside for "Quincey Quota," a mythical person or "fugitive" used to represent the quota set.

"Each salesman's quota was really a fugitive until the salesman sold his quota and thus caught the fugitive," explained Sales Manager C. O. Carpenter, Jr., of the City Utilities Board. "We just adopted the name 'Quincey' to make it sound snappy."

All salesmen and sales girls started out at the beginning of the campaign as special police and were given a small badge bearing that insignia. After a salesman had made 30 per cent of his quota, he was promoted to special officer. After reaching 60 per cent of his quota he became a deputy sheriff, and when he had made 100 per cent or more of his quota he was promoted to the full rank of private detective and was "graduated into the same class as Sherlock Holmes, Hawkshaw, Pinkerton, Burns, and other famous detectives."

All prospects were turned over to retailers for merchandise or to electrical contracters if electrical work was wanted.

Dealers put on a concerted drive, backed up by advertising, for the sale of the following equipment: cooking and baking, water heating, refrigeration, mechanical cooling and accessories, and ventilation. Electrical contractors united in display advertising to make special wiring offers.

Records for sales were smashed and 15 salesmen had reached the "Quincey Quota" as the 90-days campaign came to a successful close. Percentage of quota reached by the 15 ranged from 285 per cent by Salesman D. F. Tinsley down to 102 per cent by Mrs. Dorothy Godfrey. Others who reached the "Quincey Quota" were: H. T. Wallin, D. B. Benscoter, J. W. Goans, H. B. Jones, J. C. Beck, W. R. Jollay, Miss Frances Wylie, J. B. Bowman, Miss Ruth Wells, J. H. Mullins Jr., A. H. Stansberry Jr., L. B. Pierson, and Miss Gladys Isbell.

Before the campaign was launched, estimates had been made as to what dealer sales should be for the three months. For instance, dealer sales on refrigerators were estimated at 900. However, after the dealers had turned in their sales reports, it was found that a total of 1375 refrigerators had been sold during the campaign. That compared with 865 for the same period in 1938 and 1358 in 1937.

The estimated dealer sales of water heaters had been set at 285, but instead 318 were sold, as compared with 138 for the same period in 1938 and 131 in 1937.

A total of 591 electric ranges were sold during the campaign, compared with 338 for the same three months in 1938 and 472 in 1937.

Electric washing machines by dealers totaled 964 during the campaign, as against 724 for the same

GREAT BARGAINS
LOUISIANA PURCHASE COST THE UNITED STATES $15,000,000 - OR ONLY $15 PER SQUARE MILE
BUT THE BIGGEST BARGAIN IS THE NEW THRIFT FAMILY RATE!
COMING SEPT. 1ST.
3½¢ 3¢ 2¢
GREAT BARGAINS
You Can Buy A Modern Newspaper For Only 5¢
YET IT COSTS THOUSANDS OF DOLLARS FOR EQUIPMENT AND SERVICE TO PREPARE AND PRINT IT.
BUT THE BIGGEST BARGAIN IS THE NEW THRIFT FAMILY RATE!
COMING SEPT. 1ST.
3½¢ 3¢ 2¢
GREAT BARGAIN
YOU CAN SEND A LETTER AROUND THE WORLD for 5¢
BUT THE BIGGEST BARGAIN IS THE NEW THRIFT FAMILY RATE!
COMING SEPT. 1ST.
3½¢ 3¢ 2¢
GREAT BARGAINS
ARKANSAS AS PART OF THE LOUISIANA PURCHASE AND CONSISTING OF 53,335 SQUARE MILES COST $800,025 $15.12 PER SQ. MILE EACH YEAR PRODUCES $320,640,715!
BUT THE BIGGEST BARGAIN IS THE NEW THRIFT FAMILY RATE!
COMING SEPT. 1ST.
3½¢ 3¢ 2¢

Teaser ads emphasized the "bargain" quality of Arkansas Power and Light Company's new "Thrift Family Electric Rate."

Electrical contractors cooperated with the City of Knoxville and local appliance dealers during their intensive 90-day sales campaign by advertising special low terms on wiring.

time in 1938 and 454 for the same three months of 1937.

Radio sales totaled 1354 for the three months, against 853 for 1938 and 1093 for 1937.

The three months' "Man Hunt" saw sales by dealers run up to 17,033 units, as compared with 14,063 for the same time in 1938 and 14,650 for the same three months in 1937.

All salesmen and sales girls who went out after prospects in the unusual campaign are employes of the City of Knoxville Electric Department. They themselves did not attempt to actually close sales, as the city does not sell merchandise, but they made it possible for dealers to sell what the prospects said they wanted.

Each of the city salesmen has a "dealer's prospect memo," a printed form on which is filled out the date, dealer, customer, address, and space to describe what the prospect is interested in. There is also a printed request for the dealer to return the memo to the city department. If a prospect expresses a preference for a certain product then the memo is turned over to the dealer who handles that product. If no preference is expressed, then the prospect memos are distributed among dealers by a dealer-coordinator employed by the city.

Ninety-two per cent of the hot water heaters sold as a result of the unusual campaign were through memos furnished dealers by city salesmen. Sixty-five per cent of the electric ranges sold were also from the memos. The results for these two appliances indicate just how effective the memos really are.

Dealer Problems Studied in Survey

(*Continued from page* 6)

"Service supplied on a time and material basis with time charged for at $1.50 per hour."

"$3.00 per range service call and $2.00 per water heater service call, if company assumes full responsibility. These amounts are reduced to $2.00 and $1.00 respectively if dealer supplies replacement parts."

"Labor is provided free on all appliances except refrigerators. Repair parts are charged for at actual cost."

"$1.00 per hour is charged for time, plus list price on material, unless material is supplied by dealer."

Companies serving 95.0% of the total number of domestic customers reported that they actively promoted appliance sales in some form. This promotion ranges from sales promotional advertising to intensive merchandising departments. However, those companies replying that they did not merchandise appliances at all served a total of 20.7% of the residential customers. Companies merchandising appliances to a limited extent, in some cases restricting their operations to the sale of small appliances, and in other cases restricting it merely to certain load-building appliances such as ranges and water heaters, serve 13.3% of the total number of residential customers. On the other hand, 66.0% of the total number of residential customers were served by companies operating aggressive merchandising departments and handling full lines of household appliances.

Particular attention was given to the practice of some companies which provide dealers or their salesmen with specific bonus payments for adding load-building appliances such as ranges and water heaters to their distribution lines. Companies serving 14.5% of the total number of residential customers were found to have such policies in effect. However, companies serving 27.1% of the total number of domestic customers indicated that they gave either bonus payments or campaign prizes to dealers and their salesmen during special campaigns. The remaining companies serving 58.4% of the residential customers pro-

A spirit of fun was injected into the special campaign of the City of Knoxville by calling it a "Man Hunt." Salesmen were hailed into city court at start of the campaign where they were commissioned as special police and ordered to scour the countryside for the mythical fugitive, "Quincey Quota." As salesmen achieved prescribed portions of their quota they were promoted in rank.

vided no bonus payments or subsidies to dealers or their salesmen for the sale of load-building appliances such as ranges and water heaters.

Of the companies providing regular bonus payments, the amount and the method of making bonus payments varied considerably.

The following excerpts were taken from replies of companies making such payments:

"Dealers are paid a bonus on sales of ranges or water heaters handled by the utility companies. Dealers' salesmen are paid bonuses only during special campaigns."

"The bonus is paid dealers on major appliances after monthly quota has been sold."

"A bonus of $4.00 is paid for each range sale; $6.00 for each water heater sale, provided they are not replacement sales."

"A bonus of $4.00 is paid for each range sale and $8.00 for each water heater sale."

"A $20.00 promotional allowance is paid to each dealer for each range he sells."

"Bonus payments of $5.00 for each range and $8.00 for each water heater, whether new or second hand, is paid provided they are not replacement sales. These amounts are charged back against the dealer in the event that appliances are repossessed."

Commercial Cooking Activity Report

(*Continued from page* 9)

Company	65
Dealer	14
Dealer-Company	14
Manufacturers	6
Manufacturers and Company	4
Seller	4
Contractor and Company	3
Contractor	2
Kitchen Equipment House	2
Company and Local Electrician	2
Miscellaneous Replies	10
No reply	2

Plans for 1939 Activities

More extensive promotion of commercial electric cooking sales during 1939 was planned by eighty-five companies, while eighteen companies expect to carry on the same as last year.

Over 86% of the reporting companies indicate they intend to avail themselves of the material and help that the Council offers for the promotion of this type of business. This indication reassures the Council that its efforts are well directed.

The use of the material already developed will make possible the preparation of similar aids for the future development of this profitable load. The Council will welcome comments and suggestions for future activities.

Testimonial Type Advertising Effective

(*Continued from page* 13)

knows or has heard about, showing what they did and how small their electric bills were for the service they received. If it is an argument that an electric range is slow, there are ads to show the experience of local women along this line. The ads break down sales resistance far more effectively than any company or manufacturer's "visualizer" or folder. The ads also are used as small broadsides to go into the company's mailing of bills.

Tampa Electric serves other communities in its trade territory, and an early objection to the plan was that it would be useless in these surrounding towns. A few ads were published in the different towns to get the local reaction. They were just as effective there as they were in Tampa although the women pictured were of a neighboring city.

In Tampa, Sunday newspapers were used to take advantage of the larger circulation coverage and more leisurely reading habits.

As a result of the success of the campaign with women, Al P. Burgert, Tampa photographer for a national magazine who handled the picture assignments, suggested the use of testimonials by men. The idea sounded good because the world is full of men who think they can cook and like to have a hand in kitchen affairs in their homes.

When word got around that we would start the new series, men appeared with claims of their culinary ability. One of Tampa's most prominent business men was shown cooking his favorite recipe of Pompano Papillot on his wife's electric range. The ad showed him in a kitchen apron, smoking his habitual cigar, and gave his recipe along with what he thought of electric cookery.

"Boy, that electric range gets hot quick," he said in the headline. Then he went on to tell why he, as a kitchen hobbyist, preferred an electric range.

This ad also announced the organization of "The Ancient and Honorable Order of Coqui," or "Gentlemen Cooks," and others were invited to send their recipes.

In this club each member is given a certificate of award properly framed and worded so as to be hung alongside his hole-in-one certificate or other trophies.

The day after the first ad was published, the gentleman cook walked into my office carrying a chef's uniform that had been sent to him by a garment manufacturer. He said he had been besieged with calls, congratulating and joking him on his cooking ability. To show the ad was read, his negro cook asked him for more information on his recipe.

The men's recipes are used in the cooking schools held in Leisure House, a department of the company devoted to demonstration work. The women attending the schools are enthusiastic and their requests for the "he-man" menus are beginning to surpass those for the company's own.

Leisure House is an important part of Tampa Electric's promotional program. It is a part of a merchandising setup originated by the company which has attracted national attention. One of the best transcribed radio shows on the market has been created from the name, Leisure House. It is produced by Mertens and Price of Los Angeles.

The name, Leisure House, has been protected for the exclusive use of electric companies, and its success in Tampa and the national publicity given to the radio show are making it an electrical trademark of real value.

Value of Display Floor Found in Survey

The effect of appliance displays on actual sales is indicated by a survey recently completed by the Electric Institute of Washington, an organization supported by all branches of the electrical industry of Washington, D. C. The Institute survey indicated that approximately 5,500 of the interviews on the Institute's display floors during 1938 resulted in buying decisions totaling $613,653. And even more significant is the fact that approximately 60% of these prospects actually purchased the items discussed at the Institute within thirty days after their visit.

CONTRACTING SECTION

Fluorescent Lighting Acceptance Increases in Oklahoma City

By O. D. Hall

STEADY advancement in the acceptance of fluorescent lighting has been made in Oklahoma City since its introduction there on a commercial scale less than eight months ago. Recognizing its great advantages for certain types of illumination, electrical contractors and illuminating engineers generally, have not tried to oversell the idea, but to make installations where conditions were best adapted for this advanced form of lighting.

While some demonstration and educational work has been necessary, flourescent lighting has had a tendency to sell itself to enterprising merchants who are handling goods which can be displayed to better advantage under fluorescent lamps.

One of the largest and most interesting installations of fluorescent lighting in Oklahoma City has been made in a beauty parlor where display of goods is not the main objective.

Before fluorescent lighting had become more than a novelty in Oklahoma City, Z. Hirsch, owner of the Oklahoma Electric Supply Company, arranged a demonstration set-up in his company's offices, which would permit beauty shop operators to work on customers under fluorescent lighting.

The demonstrations, conducted under supervision of B. H. Hartley, illuminating engineer of the Oklahoma Electric Supply Co., proved so successful that owners of one of the largest beauty shops ordered a complete installation in their new shop completed earlier this year.

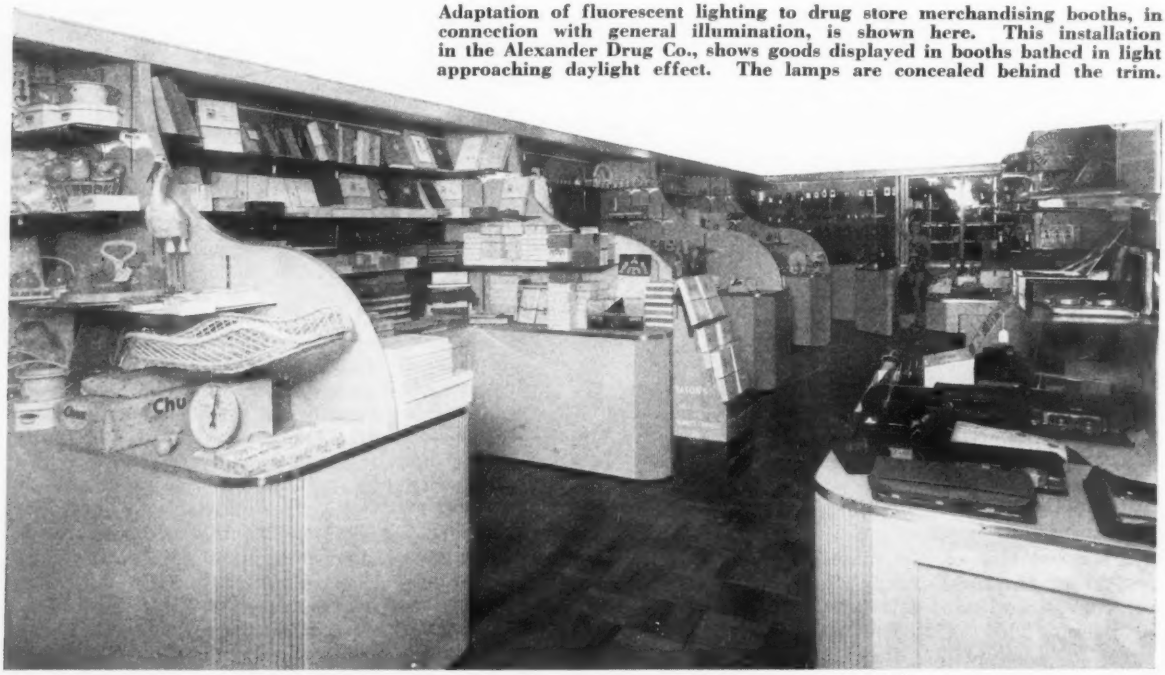
The beauty shop installation is described as follows by Mr. Hartley:

"A lighting intensity of 50 foot-candles at working level of the treatment booths was desired. Due to the extreme ceiling height of twenty feet, it was found that it would be necessary to install fixtures and incandescent lamps totaling 4,500 watts to accomplish this intensity with general illumination.

"The booths consist of partitions 8 feet in height with the ceilings open. We therefore installed a continuous wood trough, 5 inches in height and 15 inches in width, across the tops of the partitions, morticing the trough to partitions, leaving the bottom of the trough 7 ft.-10 inches above the floor.

"Fixtures were constructed to house the auxiliaries for the fluorescent lamps, as well as a specular alzac reflector for the three 20-watt, T-12 daylight lamps, mounted parallel to each other.

Adaptation of fluorescent lighting to drug store merchandising booths, in connection with general illumination, is shown here. This installation in the Alexander Drug Co., shows goods displayed in booths bathed in light approaching daylight effect. The lamps are concealed behind the trim.



These units were recessed in the trough and centered over the customer's chairs in each booth. Where mirrors were used in the treatment booth, the lighting units were placed off-center of the booth, directly over the mirror to provide direct light on the customer's face, while the light source, being overhead, remained out of the line of vision.

"There are ten booths in this shop and each is equipped with one lighting unit of 3-24-inch, 20-watt daylight fluorescent lamps. This is a total of 60 watts per booth, not including the auxiliaries, with initial intensity at customer's head level of 52 foot-candles.

"The manager and all operators are very enthusiastic, claiming that the daylight effect has very definitely assisted them in hair dying and that the well diffused, high intensity light is much more comfortable than customary incandescent lighting.

"The cost of the installation was approximately three times that of the estimated incandescent system," said Mr. Hartley, "however the difference in cost will be amortized within a period of 24 months, in current saving alone. At the time of this installation, no power factor correcting equipment was available. Approximately 1¼-tons of refrigeration was gained in the air conditioning system as a result of the cooler operation of these lamps.

"Three 200-watt direct diffusing fixtures were installed overhead to create a lighted appearance in the upper section of the room above the booths. No supplementary fixtures were found necessary in the booths."

Partial view of fluorescent lighting of show cases and glassed in wall cases in the Reeves Camera Store, of Oklahoma City, installed by Southwestern Electric Co., Inc., Oklahoma City.

Effective Booth Lighting

Adaptation of fluorescent lighting to merchandising booths is being effectively demonstrated on the main floor of the Alexander Drug Co., wholesale druggists, Oklahoma City. The drug establishment management was introduced to the idea during the annual druggists' short course, at the University of Oklahoma, Norman, on January 25 of this year. The Oklahoma Gas and Electric Co. gives commercial lighting demonstrations during each of these short courses and had lighted the special booths installed there with fluorescent lamps.

Partially sold on this new form of lighting for the purposes demonstrated at the short course, the management of the Alexander Drug Co., contacted the Oklahoma Electric Supply Co. The latter worked out plans and made the installations which have just been completed.

The wholesale drug firm is trying to encourage Oklahoma retail druggists to install departmental booths displaying various types of merchandise commonly carried in modern retail drug establishments, under proper illumination. It has arranged nine booths on its main floor, each seven feet long which are illuminated by 20-watt daylight fluorescent lamps. Eighteen lamps, two to each booth, with equipment and reflectors, are so skillfully concealed that actual, somewhat subdued daylight, seems to be flooding into the booths from invisible windows in the wall back of the displays.

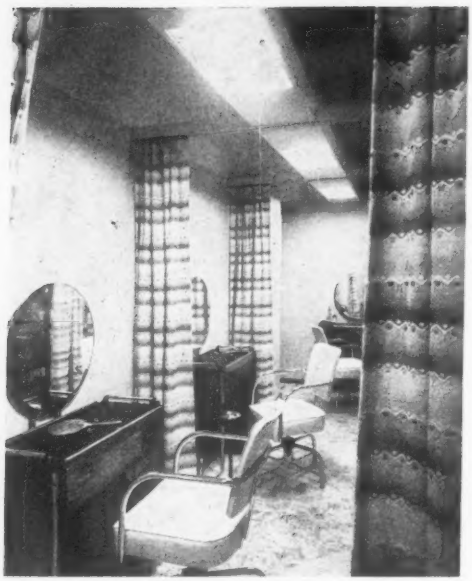
In each booth is displayed a particular line of articles such as clocks, baby goods, hygienic and sanitary supplies, cosmetics, cameras and luggage. Lighting units for each booth are separately controlled and can be switched on and off at will.

The preliminary demonstration method of selling fluorescent lighting again was worked out successfully by the Oklahoma Electric Supply Co., in an originally designed adaptation for triangular mirrored alcove purposes in men's clothing stores. At the time of this writing the demonstration period had just been completed in such an alcove in May Brothers' clothing store, downtown Oklahoma City. The trial installation proved so pleasing that May Brothers have asked the electrical firm to install two more similar fluorescent lighting assemblies in the store. In each alcove are placed two 18-inch and two 24-inch daylight lamps housed in one piece reflector units. Mirrored alcoves, thus equipped, enable the customer to view the suit he is trying on from every angle without confusing shadows and to correctly judge its fit and true colors.

Show Case Units Used

This same store also is employing fluorescent lighting in seven show cases on its main floor near the street entrance. Fifteen and 20-watt fluorescent lamps are installed in specially constructed one-piece reflectors. These housings are practically invisible and shed a soothing white light on displays of neckties, men's hosiery, handkerchiefs and other small articles, bringing out the true beauty and quality of the merchandise.

Fluorescent lighting installations also were made by the Oklahoma Electric Supply Co., in show cases on the main floor of W. J. Pettees Department Hardware store, No. 1, Oklahoma City. Similar lamps also are used in wall cases and on sloping shelves in the basement, where tools and other hardware are displayed under conditions simulating daylight filtering through the walls back of the shelves. One hundred fluorescent



A lighting intensity of 52 foot-candles at customer's head level is attained by this fluorescent lighting installation in Virginia's Beauty Studio, Oklahoma City. Each of ten treatment booths, three of which are shown here, is equipped with three 24-inch, 20-watt daylight fluorescent lamps, installed by the Oklahoma Electric Supply Co., Oklahoma City.

units, most of them 18-inch, 15-watt lamps, were included in the Pettee installation.

An outstanding installation of fluorescent lighting has been made by Southwestern Electric Co., Inc., Oklahoma City. This is found in the Reeves Camera Store on Northwest Twenty-Third Street, Oklahoma City.

A total of twenty-eight units were included, one 36-inch and one 18-inch lamp in each show case and glassed-in wall case. There are three show cases and four wall cases on each side of the central aisle. These lamps have an average illuminating intensity of 110 foot-candles.

Bill Stout, Jr., manager of the Southwestern Electric Co., sold the Reeves Camera Store installation through plans and explanation of the advantages of fluorescent lighting for show and wall case merchandising display purposes and through cooperation with the illuminating engineer of the Oklahoma Gas & Electric Co., who gave visual demonstrations of the lighting effects in the illuminating display rooms of the utility.

The Southwestern Electric Co. claims the first commercial installation of fluorescent lighting in Oklahoma City completed December 12, 1938, for the Midwest Jewelry Co., manufacturing jewelers. A No. 1400 Daybrite unit, which included three 15-watt, T-8 daylight fluorescent lamps was placed in six-foot showcases.

"This installation proved particularly effective in displaying silver and gold articles against a black background," said Mr. Stout. "However, because the light is so highly diffused there is not enough sharpness to prove so effective for some purposes in the jewelry business, particularly for showing off diamonds."

After a little experimentation, the Oklahoma Electric Supply Co. found that white light fluorescent lamps were best suited for illuminating meat show cases. The company first tried daylight lamps in meat display cases of one downtown food store but found that these gave the meats a rather sickly and clammy appearance. After substituting the white light lamps in the cases it was found that the natural colors of the meats and other products in the show cases were correctly and pleasingly brought out. Such experimentation is necessary if the most effective applications are to be obtained in new fields.

The electric company specially designed reflector units 30 feet long and installed them along the front-top angles of the show cases. These reflectors are practically invisible and their comparative coolness particularly adapts them for lighting refrigerated show cases in which perishable foods are displayed.

Trial Installations to Test New Wiring Methods

A MOVEMENT to bring about the use of thin wall insulated conductors, bare neutral feeders and C.N.X. cable in New Orleans has been started by the Electrical Association of New Orleans in cooperation with the New Orleans Public Service, Inc., representatives of the city of New Orleans and the Louisiana Rating and Fire Prevention Bureau.

The city electrical inspection department has agreed to a "fair field test" of the equipment in specific construction and the Rating Bureau has tentatively approved the risk angle after an inspection of installations of these materials by representatives of the city, the Association and Public Service and the Rating Bureau in cities where it is used.

A committee of three visited Omaha, Neb., Detroit, Mich., Buffalo, N. Y., and other cities where the equipment has been in use for sometime and returned with reports so favorable that decision to give it an immediate trial in New Orleans was reached.

P. L. Muller, chief electrical inspector for New Orleans, said that "past experience and the knowledge gained on this tour convinces me beyond a doubt that our government and the electrical industry are actively engaged in providing an adequate share of electric service for all the people.

"The low cost new materials may be the means of increasing copper carrying capacity, outlets, efficiency, safety, work hours, electric service and profits," he continued. He expressed belief that the new equipment may "serve as a medium for promoting a successful and adequate copper and outlet sales campaign."

Referring to a stop the party, of which he was a member, made at Detroit, Mr. Muller said they found that approximately 2,000 residences were wired with C.N.X. cable and bare neutrals and that thin wall insulated wires are being used in rewiring old buildings. They saw a bare neutral that had been installed in a hospital for 15 years. He said repeated tests showed no radio interference de-

(*Continued on page* 70)

Inspectors Take Action on Code Changes Proposed for 1940

EARLY disposition of the Code cnanges proposed by the Edison Electric Institute marked the first session of the eleventh annual meeting of the Southern Section, I.A.E.I., in Asheville, September 18.

The Southern Section rejected practically all of the Edison Electric Institute's proposals by adopting a report on the subject presented by a special committee appointed at the last annual meeting. This committee, headed by N. E. Cannady as chairman, reported that: "The data submitted by the Edison Electric Institute on the bare neutral, covered neutral, and CNX cable, is not sufficient to convince a majority of this committee that these methods of wiring are safe.

"The developments in the manufacture of thin wall insulations by the manufacturers have brought about an entirely new situation that deserves the fullest cooperation of all."

A minority report was also filed by members of the committee. This minority report concerned the proposal of "removal of requirements for mandatory use of rigid conduit in theatres, elevators and hazardous locations and of metal-clad wiring in garages."

The minority group reported "that this proposal is perhaps too comprehensive, and should have brought out the fact that differentiation should be made between fire-resistive theatres of a metropolitan district, and non-fire-resistive structures, combination auditoriums, meeting halls, etc." The Section went on record as approving this minority report.

Other members of the committee studying the Edison Electric Institute's proposals were Dewey L. Johnson, Atlanta; T. W. Bowry, Richmond; George Welman, New Orleans; and John Flanigen, Atlanta.

With the controversial proposals of the Edison Electric Institute disposed of, the balance of the meeting was devoted to more or less routine discussions of the "Article Committee Reports to 1939 Meeting of Electrical Committee."

For the most part, the Southern Section was in agreement with the Article Committees on changes proposed for the 1940 Code. In a few instances, however, changes and deletions in the recommendations of the Article Committees were adopted.

In section 2108, the Section voted to retain the 80% rule applying to circuits supplying continuous loads such as store lighting and similar loads. The Section recognized that such a rule should be worded carefully and the motion included that a committee be appointed to study proper wordings for this rule.

Considerable discussion centered about section 2110 relating to the spacing of receptacle outlets for residential occupancy. The group voted, however, to accept the revised wording recommended by the Article Committee.

In section 2113, relating to common neutrals, the meeting voted

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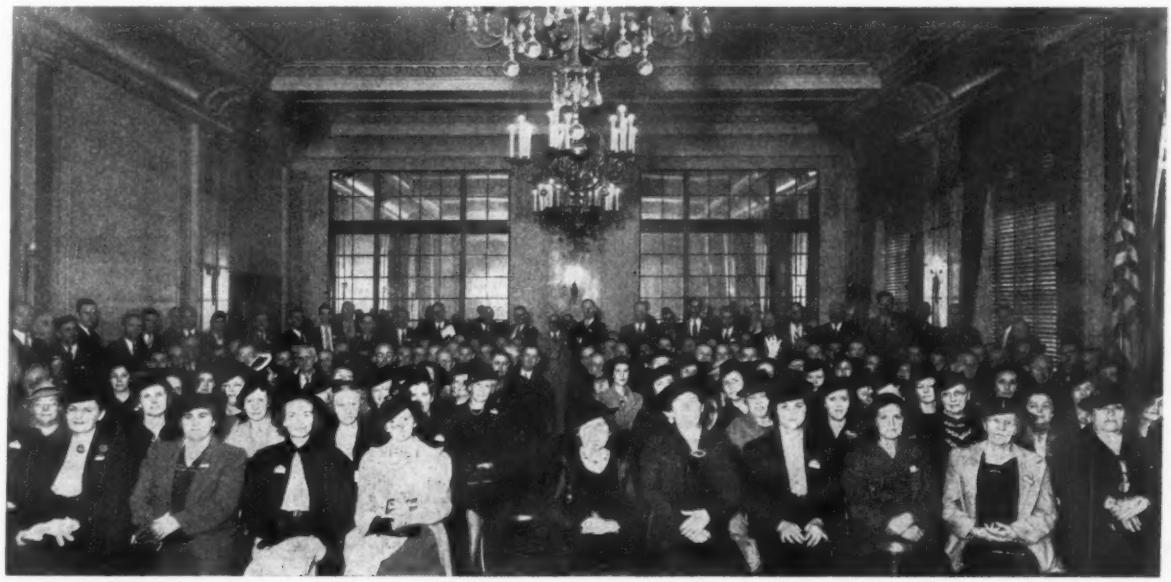
Record-breaking attendance marked the eleventh annual meeting of the Southern Section. Seventy ladies were registered, for whom an interesting program of entertainment was arranged.



New officers of Southern Section for ensuing year: left to right, Joseph Whitner, secretary-treasurer, Atlanta; C. S. Whitaker, president, Durham, N. C.; Frank G. Camus, first vice president, Shreveport, La.; and W. A. Stall, second vice president, Jacksonville, Fla.

that the rule be worded so as to require that the common neutral be the same size from end to end.

Another proposed ruling that received considerable discussion was that in section 2452 requiring that fuse holders for plug fuses of 30 amperes or less be of approved non-tamperable type. A motion was carried that requests be made of all manufacturers to make their non-tamperable fuses of an interchangeable type.

In section 3019, on coated materials, the Section did not agree that stables constituted an occupancy where severe corrosive conditions are likely to be present. The meeting voted that the word "stables" should be deleted from this rule.

In general, the meeting found all changes proposed by the Article 300 Committee agreeable except that they voted to reject a proposal relating to non-metallic sheathed cable with uninsulated grounded conductors. The group also voted that the rule relating to the identification of rubber insulation should not only require that rubber-covered conductors have a readily identifiable marking to indicate the grade of insulation, but shall require that these markings be permanent and continuous.

In article 320, the Section voted to reject the proposed change in section 3202 and to leave this rule as it exists in the 1937 code. Similar action was also taken on a proposed revision for section 3242. A motion was adopted that the wording of the proposed revision of section 3204 on boxes at outlets should be revised to read "A box or an approved fitting shall be installed at each outlet and switch point in open wiring."

In Article 730 covering outside wiring, the Southern Section voted to delete the words "electrical metallic tubing" from the proposed revision of section 7301.

Considerable interest was manifested in the address of the International President, Dr. Morton G. Lloyd, Bureau of Standards, Washington, D. C. Dr. Lloyd discussed many of the important problems now facing the I.A.E.I. and suggested solutions for some of them. Because of the wide scope of the proposals contained in Dr. Lloyd's address, President A. J. Bommer appointed a committee consisting of Dewey L. Johnson, Atlanta, J. L. Speights, Richmond, and C. V. Reynolds, Savannah, to study the proposals in detail and report back to the meeting at the concluding session at which time definite action would be taken. This committee reported back to the meeting with definite recommendations on Dr. Lloyd's address and all of them were adopted by the Southern Section. Excerpts from the committee's report follow:

"Dr. Lloyd's recommendations with regard to bare neutral and covered neutral wiring have already helped this Section to join other I.A.E.I. sections in declining at this time to support any extension of these proposed wiring practices, and in opposing any present change in National Electrical Code to permit any extension in the use of such wiring methods.

"Dr. Lloyd's recommendations with regard to non-tamperable fuseholders and fuses, and with regard to emergency lighting have likewise aided our Section, in its actions, to deal soundly with proposed Code changes on these items —harmonious with his recommendations.

"In addition to these recommendations of Dr. Lloyd's already dealt with by this Section, and on which our committee now offers no additional recommendations, there are the following matters helpfully dealt with in Dr. Lloyd's address, on which our committee makes the following recommendations for Section action, by Section endorsement of this committee's report.

"We recommend that the secretary of the Section forthwith re-

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In the Photos—

(1) Dr. M. G. Lloyd, president, I.A.E.I., Washington, D. C., Mrs. J. G. Fisher, Jackson, Miss.; A. B. Smith, N.E.M.A., New York; Mrs. M. M. Brandon, New York; and Mr. Brandon, Underwriters' Laboratories.

(2) Arthur L. Holbrook, president Eastern Section, Winsted, Conn.

(3) Mrs. T. W. Bowry, Richmond; Mrs. E. J. Thibodeaux, Thibodeaux, La.; and Mrs. M. G. Lloyd, Washington, D. C.

(4) H. H. Hix, Jr., and H. H. Hix, Sr., manager, Graybar Electric Co., Asheville.

(5) C. S. Whitaker, president-elect, Southern Section, Durham, N. C.; H. J. Flynt, electrical inspector, Winston-Salem, N. C.; and Clark Richardson, Cutler-Hammer, Inc., Atlanta.

(6) Arthur L. Abbott, N.E.M.A., New York.

(7) J. L. Speights, Virginia Elec. & Power Co., Richmond; T. W. Bowry, chief electrical inspector, Richmond; and E. J. Thibodeaux, superintendent of light and water, Thibodeaux, La.

(8) C. V. Reynolds, electrical inspector, Savannah; Miss Emmie McKranie, and J. T. Clark, Wadsworth Elec. Mfg. Co., Atlanta.

(9) A popular corner.

(10) J. C. Parker, city mgr., Elizabeth, N. C., and Mrs. Parker.

(11) Miss Ruth Hausman, young daughter of Carl A. Hausman, Crouse-Hinds Co., Atlanta.

(12) Mrs. Frank G. Camus, Shreveport, La.; Victor H. Tousley, national secretary, I.A.E.I., Chicago; and Mrs. J. G. Fisher, Jackson, Miss.

Among Those Present in Asheville

(These candid camera "shots" were made by, and are used through the courtesy of, John B. Booth, district manager, Bussman Mfg. Co., Richmond, Va.)

examine the qualifications of each active member, changing to associate membership such as are not, by a strict interpretation of the Articles of Association, entitled to active membership, and that in the pursuance of this purpose, and with regard to prospective new active members, the secretary shall ask of each present prospective member the necessary questions for the Section records, entering such questions hereafter, on the application blanks to be signed by prospective active members . . .

"We recommend that the Section request the International Association to take any necessary steps to secure in National Electrical Code, as promptly as possible, new rules setting reasonable limits to motor starting currents and to other related motor characteristics so that motor and motor-circuit over-current protective devices will more adequately protect both motor and motor circuit from overcurrent dangers.

"We recommend that the National Electrical Code be made to retain and extend the practice of including sufficient requirements for the character of materials, devices and appliances, so that the installation requirements of the Code will refer to materials, devices and appliances actually specified in the Code itself, so that the inspector may have authority in the Code for rejecting non-complying material, as well as non-complying methods.

"We recommend that the National Electrical Code be made to include minimum standards reasonably adequate for urban and rural conditions, and in addition be made to include such additional minimum standards as are warranted for the additional hazards in urban congested population or congested property value areas or zones, and in single buildings or groups of buildings, of large property value or containing many people, wherever located.

"By such an extension of the National Electrical Code, it is expected that fewer local rules will be needed or desired by the municipalities and other groups concerned with assuring the safety of numbers of persons and of large property values."

A question was raised by the resolutions committee as to why the 1933 National Electrical Code was changed to require an increased insulation thickness from 3/64 inch to 4/64, plus a protective braid, for No. 8 wire. The resolutions committee also requested that the annual meeting of the Southern Section resolve that I.A.E.I. representatives on the Electrical Committee be instructed by the Electrical Council to oppose the removal of the protective fibrous covering on insulated electrical conductors until such time as they have been furnished sufficient information that will convince them that the conductors without a braid or fibrous covering will make a product that will be the equivalent in dielectric and mechanical strength and maintain its uniform shape in the field. The meeting adopted this report of the resolution committee.

Because of the considerable amount of time required to discuss proposed code changes, only a few addresses were scheduled on the three-day program. The first morning session featured an address of welcome by the Honorable Holmes Bryson, mayor, Asheville; a response by T. W. Bowry, of Richmond; an address by the Section president, A. J. Bommer, Dallas; a report of the I.A.E.I. secretary, Victor H. Tousley, Chicago; and an address by the I.A.E.I. president, Dr. Lloyd, mentioned previously.

Henry J. Morton, special representative, Edison Electric Institute, addressed the meeting Monday afternoon. At the same session John W. Whittington, N.E.M.A., New York, presented a motion picture entitled "Preventing Fires through Electrical Safety."

Speakers at the Tuesday sessions were M. M. Brandon, associate engineer, Underwriters Laboratories, New York, who spoke on "Proper Wiring of Panelboards." Arthur L. Abbott, N.E.M.A., addressed the Tuesday afternoon session speaking on "Factors Affecting the Future of the Electrical Industry."

A discussion of fluorescent lighting equipment and design was presented by Carl W. Evans, editor, ELECTRICAL SOUTH, at the Wednesday morning session.

New officers were selected at the concluding session to direct the activities of the Southern Section during the ensuing year. Those elected were: C. S. Whitaker, electrical inspector, Durham, N. C., president; Frank G. Camus, city electrician, Shreveport, La., 1st vice-president; W. A. Stall, chief electrical inspector, Jacksonville, Fla., 2nd vice-president; and Joseph Whitner, assistant chief engineer, Southeastern Underwriters Association, Atlanta, Ga., secretary-treasurer.

Members of the executive committee include: Dewey L. Johnson, superintendent of electrical affairs, Atlanta, chairman; C. S. Graham, city utilities inspector, Jacksonville, Fla.; L. A. Turnage, Sonoco Products Company, Hartsville, S. C.; P. L. Muller, chief electrical inspector, New Orleans; A. J. Bommer, Underwriters Laboratories, Inc., Dallas.

Reciprocal Program Advertises Florida

FOR the third successive year, the Florida Power Corporation will carry out a reciprocal development program with power companies in the New England area, it was announced recently by Fred R. Francke, assistant to the president of the Florida utility.

Window displays to ilustrate New England's advantages in the summer will be shown in Florida, and in return, Florida's attractions will be revealed next fall and winter to the freezing public in the windows of the New England Gas and Electric Association offices in ten cities of the northeastern territory.

"One of the important features of our program of mutual interest with New England," said Mr. Francke, "is the opportunity it gives us to cooperate in the promotion of Pinellas County as a whole—to provide a new outlet to tell the many advantages of our excellent climate and industries."

The company is also carrying on an advertising campaign along institutional lines which aims to broadcast the industries, recreational activities and historical features of Pinellas County.

In carrying out its reciprocal program, Florida Power Corporation works with local civic and community development organizations. Chambers of commerce in all of the cities participating in the campaign have contributed Florida recreational literature for distribution in New England and last year about 20,000 booklets on the sunshine state were distributed as a result of this co-operative activity. Other northern communities may join in the movement.

ENGINEERING SECTION

Standardized Test Procedures For Ceramic Insulators

By Edwin M. Meyer
Chief Electrical Engineer
Porcelain Products, Inc.,
Parkersburg, W. Va.

PERFECT continuity of service is the goal of every power system engineer. The achievement of this goal depends, among other factors, upon the construction of generating plants, switching stations, transmission lines, substations and distribution lines that are capable of continuous operation under all conditions of weather, extremes of temperature, wind stresses, vibration, and extraordinary mechanical and electrical loading.

This highly desired feature of reliability and service continuity depends no more, perhaps, upon any single class of construction equipment than it does upon the ceramic insulator in its various forms.

Ceramic insulators are used in central stations for carrying generator bus bars and reactors; they are used in outdoor switching stations for carrying switching bus structures; they find a job on transformers and outdoor oil circuit breakers where strong, weather-proof bushings are needed; they serve an important mechanical and electrical function in outdoor airbreak switches and fuses; they carry the load on outgoing transmission lines.

They are equally important in all types of terminal equipment, being found again on outdoor substation bus structures, switches, fuses, and transformers. They find their place on potheads and cable seals where lines go underground. They carry the distribution feeders, and they serve a vital need on distribution transformers in bushings and tap changer plates. They are indispensable for carrying secondaries and house services where their mechanical ability looms as important as their electrical insulating quality.

Almost without exception, in all of the above applications the insulator serves a dual function. It is a mechanical support as well as an electrical insulator. It goes without saying that electrical failure of an insulator on any part of a circuit is fatal to the chances of continuation of operation of that circuit. A mechanical failure may also be fatal as it may cause subsequent electrical breakdown of the insulator or it may allow actual physical contact between phase and ground with disastrous effect.

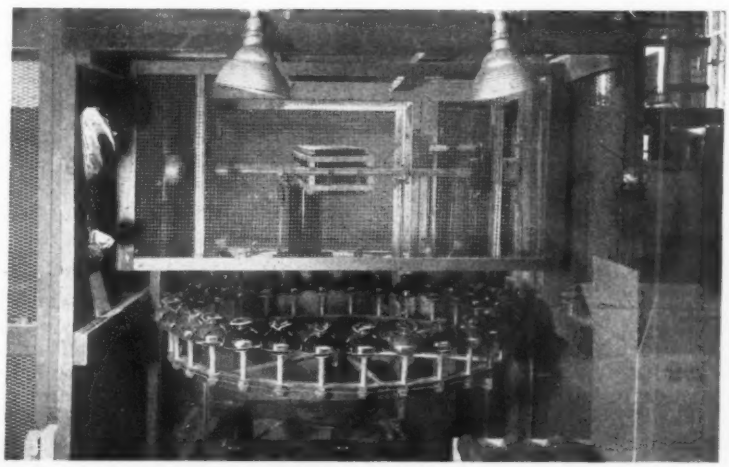
Importance of Testing Insulators

It follows necessarily therefore that the problem of determination by test of the fitness of an insulator for service is an item of great importance in its manufacture, and is an item which has been and still is the subject of cooperative study by manufacturers and users of insulators. Past studies of proper testing methods have resulted in the present American Institute of Electrical Engineers Standard No. 41 for pintype and suspension type insulators, and in the National Electrical Manufacturers' Association publication No. 35-28, standardizing testing methods and requirements for outdoor and indoor switch and bus insulators. Continued work now being carried on by these organizations in collaboration with with the Edison Electric Institute will soon result in the bringing out of a new A.I.E.E. Standard in which will be set up standardized testing procedure for all types of insulators.

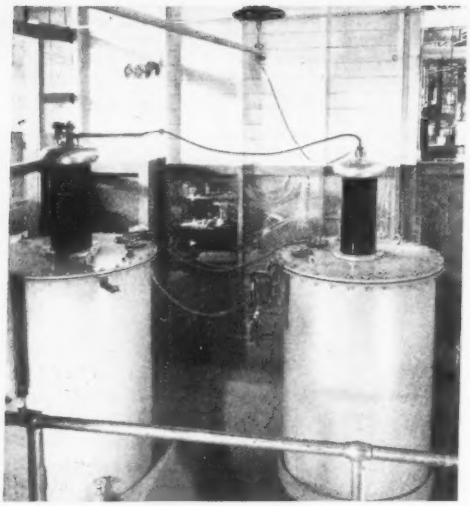
A surface consideration of proper testing methods will immediately bring out two fundamentals:

Fundamentals of Testing

(1) Design tests must be set up to establish the performance characteristics of a given insulator and its ability to serve its dual



Small pintype insulators are going through inspection and continuous 60 cycle flashover test immediately before being packed for shipment. Behind the operator's guard screen may be seen the high voltage bus and the bushing of the 100 kv, 7.5 kva testing transformer.



The General Electric testing transformers shown are rated at 150,000 volts, 60 cycles, 25 kva each. They may be connected in parallel to deliver 1/3 ampere at 150 kv, or in cascade to deliver 1/6 ampere at 300 kv. Note that the unit connected to the high voltage bus is on an insulated pedestal for cascade connection in which the transformer tank operates at 150 kv maximum above ground potential.

mechanical and electrical function under the conditions of weather and temperature extremes to be encountered in actual service.

(2) Simple and effective routine tests must be devised to check every insulator produced as to its individual electrical and mechanical fitness for service. The idea of a one hundred per cent production check is axiomatic.

These two fundamentals form the basis for the philosophy of present day insulator testing; in each the idea of a combined mechanical and electrical test is carried out. The design tests form themselves into three natural groups:

(a) Destructive tests in which it is desired to know at what level of performance the insulator will fail.

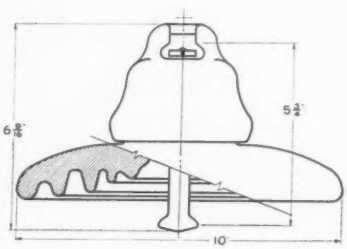
(b) Semi-destructive or sufficiency tests in which it is desired to know if the insulator will resist failure at a given level of performance.

(c) Non-destructive tests to determine the electrical flashover performance of an insulator.

Routine or 100% production tests, of course, are classed as sufficiency tests in which it is desired to know if each insulator will survive a given test, the idea being to select the level of performance low enough to prevent permanent damage to the insulators that do survive, and still high enough to have some value as an indication of the fitness of the unit for service.

It will be of interest to describe in detail the design and routine tests made in fulfilling delivery contracts on one conventional type of insulator. Consider for example a contract for standard 5¾" x 10" suspension insulators rated at 15,000 pounds combined mechanical and electrical strength, 80,000 volts 60-cycle dry flashover volts, and 50,000 volts 60-cycle wet flashover volts.

This insulator is a cap and pin suspension unit of standard design having a spacing between cap and pin connection of 5¾ inches, a shell diameter of 10 inches, and is designed for use in strings for suspending transmission conductors from the towers. It may utilize, for example, the ball and socket type of connection in which the pin terminates in a ball end designed to fit into a socket recess on the adjacent cap. The number of units used for a given transmission line will depend upon the operating voltage and the desired spacing between conductor and grounded tower; in this case any desired spacing may be obtained in multiples of 5¾ inches.



Such an insulator is illustrated in the accompanying diagram. The socket cap is made of high grade malleable iron, the ball pin or stud is commonly a drop forging of alloy steel; both are hot dip galvanized. The shell is a high grade vitreous porcelain, extremely dense and made especially for high voltage work, and is customarily furnished with a glossy, vitreous mahogany glaze to prevent collection of dirt and to render the insulator self-cleaning in rainfall.

The combined mechanical and electrical strength given above is perhaps the most important performance rating. It means that when the insulator is subjected to a gradually increasing mechanical tension load between cap and pin, in line with the axis of the pin, and when an electrical potential of 75% of the dry flashover voltage, in this case 60,000 volts, is applied simultaneously, it should not fail either mechanically *or* electrically at a mechanical load below 15,000 pounds.

In actual practice this is a destructive test as the load is always brought up to the point of first failure, whether mechanical or electrical. If the insulator is adequate this value is greater than 15,000 pounds. In average good operating practice a string of insulators of this type would be worked at not over 5,000 pounds tensile load and at a potential stress not to exceed 30,000 volts per unit on the end units. Thus the factors of safety afforded by this test are approximately three and two respectively for mechanical and electrical loading.

Mechanical Factor Governs

However, the mechanical factor should be considered governing in this case since in theory this test is primarily a mechanical test in which an electrical potential, sufficiently above the maximum operating voltage to be expected, is present for the purpose of detecting the first incipient cracking or opening up of the ceramic shell structure. In some failures recorded the insulator may actually be pulled in two before electrical distress is noted; in others, the first failure may be electrical puncture of the shell up in the head before mechanical distress is apparent. In both cases, the incipient failure is mechanical, the electrical potential serving to detect the weakened structure.

The flashover voltage of the insulator is the value at which the air breaks down or flashes over in the shortest path or striking distance between cap and pin. The dry flashover voltage is by definition (A.I.E.E. Standards) the value obtained in air at sea level, at 77 degrees F., and 65% relative humidity (Barometer 762 mm.,

vapor tension 0.6085 inches of mercury).

The wet flashover voltage is the value obtained when the insulator is under the same barometric and temperature conditions, but subjected to an artificial rainfall consisting of a spray adjusted to a rate of precipitation of 0.2 inch a minute and arranged to strike the insulator vertically downdard at 45 degrees to its vertical axis. It has been found that the wet flashover value is quite critically dependent upon the specific resistivity of the spray water, especially when long strings are tested. For this reason the A.I.E.E. standards definitely specify the resistivity; it must not be less than 6,000 ohms and not greater than 8,000 ohms per inch cube. Flashover tests are classed as non-destructive tests.

Acceptance tests for this insulator would be made in accordance with the following schedule:

(1) **Routine flashover test of shells prior to assembly** (100%). Every shell used is subjected to a five minute flashover test using potential of commercial frequency. At the manufacturer's option this test may be preceded by a damped wave high frequency flashover test of from 3 to 5 seconds duration, using a frequency of from 100,000 to 400,000 cycles. This test is particularly effective in searching out flaws in the outer parts of the shell which the low frequency test might pass over. Test loss should not exceed 5%.

(2) **Routine momentary tensile test in line with axis of cap and pin after assembly** (100%). Every assembled insulator being removed from the steam curing chamber and cleaned is given a mechanical test up to 40% of its combined mechanical and electrical rating (in this case 40% of 15,000 pounds, that is, 6,000 pounds).

(3) **Routine flashover test of assembled and cleaned insulators following routine tensile test** (100%). Every assembled insulator is given a damped wave high frequency flashover test at 100,000 to 400,000 cycles from 3 to 5 seconds, followed by a clean up flashover test for five minutes at commercial frequency. After this test, insulators should be immediately crated for shipment.

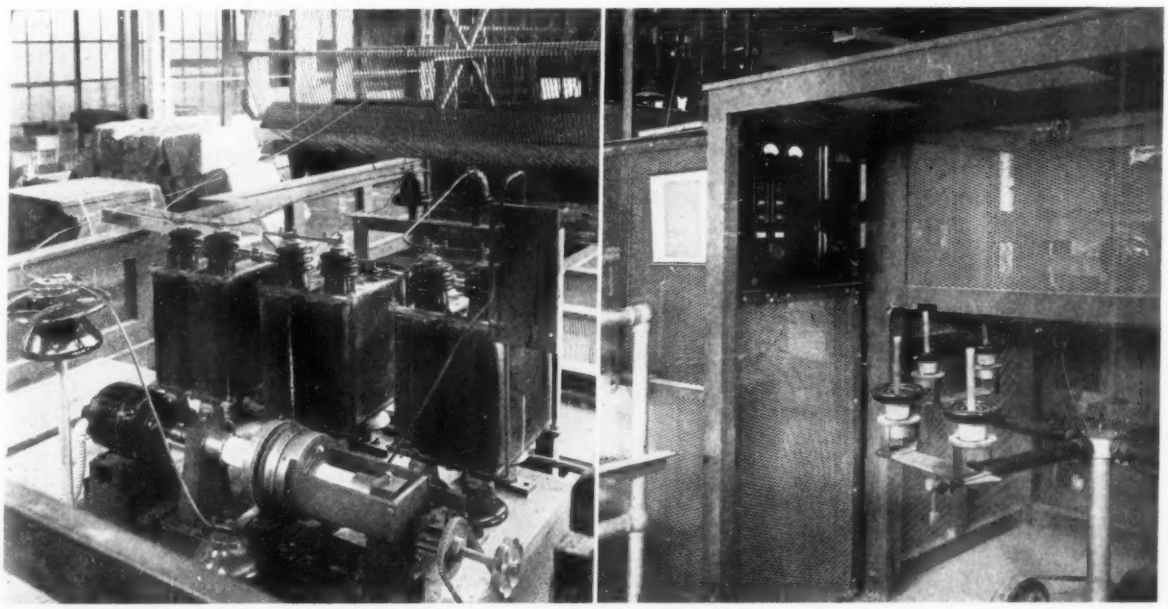
(4) **Thermal shock test on specimen assembled insulators** (customarily ten units, but not to exceed ½% of contract). Insulators are given ten thermal shock cycles, each cycle consisting of ten minutes immersion in hot water at not less than 205 degrees F., then immediately plunged into ice water at not more than 39 degrees F. and held for ten minutes. Insulators are tapped for evidence of shell cracks at end of every cycle and are momentarily flashed over at the end of the fifth and tenth cycles. Eighty per cent of insulators tested must be electrically and mechanically intact at finish of test.

(5) **Puncture test on specimen assembled units** (quantity as agreed but not to exceed ½% of contract). Insulators are subjected to electrical potential while immersed in transil oil to prevent external flashover, potential being increased at specified rate to point at which puncture through head occurs. Puncture voltage should not be less than 4/3 of rated dry flashover voltage (in this case not less than 4/3 of 80,000 or 106,667 volts). Mean variation of individual values from average value should not exceed 10%.

(6) **Combined mechanical and electrical test on specimen assembled units** (quantity as agreed but not to exceed ½% of contract). This is the test described above. Average of all test values should not be less than the rating. No single test value should be less than 85% of the rating.

(7) **Dry and wet flashover tests on assembled specimens to demonstrate ratings.** As noted above these tests are carried out in accordance with very definite A.I.E.E. specifications as to test set-up, method of application of voltage, calibration of instruments, etc. Where the contract specifies, 60 cycle and impulse flashover tests may also be performed on strings of a given number of units to demonstrate service adequacy and to furnish data for the customer for coordination studies in connection

(*Continued on page* 70)



The essential elements of a damped wave high frequency, high voltage oscillator are shown at the left. The pyranol-filled capacitors are rated 9,000 volts, 20 amperes, .0375 mfd each, and are used three in a series bank. An extra set of three is used as a standby bank. In the background is an air core, step-up autotransformer. In the foreground is a motor driven asynchronous rotary gap which can be adjusted while running by means of a chain drive from the operator's station. On the reverse face of the small panel at the right is a radio frequency ammeter in the output side of the capacitor circuit. Operator's control station for the continuous oscillator test appears at right. A 60-cycle charging transformer in the cage at the left feeds the capacitors. Taps from the air core transformer secondary come down to the high voltage oscillator bus behind the operator's guard screen. The motor driven rotary conveyor which carries the 6-inch suspension insulator shells under the bus has bakelite spokes.

Low-Cost Service Equipment Announced by R. E. A.

THE Rural Electrification Administration announced recently that it has developed, in cooperation with several electrical equipment manufacturers, new devices and techniques by which low-income farmers may have electric service at very low cost.

Commenting on the developments which REA announced, Secretary of Agriculture Henry A. Wallace said: "Wide use of this engineering advance, if it proves feasible, will make electricity available to hundreds of thousands of farm homes which cannot now afford service, even at the substantially and progressively lowered costs achieved during the four years since the Federal rural electrification program started."

The new devices consist of a small transformer, a new gap for lightning protection, a new type of circuit breaker, and an underground wire from the transformer to the house which serves both as a conductor and as a ground for the circuit. All of these pieces of equipment which constitute a "service" are being produced and marketed at very low prices, bringing the cost of electricity down to a point where a minimum bill of about $1 a month will provide revenue enough for amortization of the cost.

Lower Minimum Possible

According to R. B. Craig, Acting Administrator of the REA, this new service will permit a tenant farmer or share-cropper to have electric light and radio, and possibly other small appliances.

"The minimum bill for each user on an REA-financed power line," Mr. Craig pointed out, "averages about $2.50 in the South, and $3.50 to $4.00 in the North. These minimum bills are beyond the means of many tenant farmers, who heretofore have been unable to take electric service although the power lines pass their doors. Use of the newly developed equipment will make it possible for farm families to enjoy the minimum benefits of electricity at very low cost.

"It is not possible to use the new service drops for farms where many appliances are installed or where any power equipment is to be used. In practical service they will permit the simultaneous use of a standard electric iron, a radio, and 2 or 3 light bulbs. If the farmer finds later that he can afford to install and use more electrical equipment, the service can be replaced by one of greater capacity and the standard rate schedules made applicable.

Installation Labor Reduced

"One feature of the installation of these new services for low-income farms is that the farmer, himself, will dig the trench from the transformer pole to his house in which the service cable is to be laid, and then fill it in. This contribution of work effects a major saving in the installation cost. The entire cost of such a service is about $35 including the transformer, the circuit breaker, and the cable. The lowest cost service previously available was priced at $75 to $100. The cable itself is so inexpensive that if the farmer does desire to use a larger service, it will be cheaper to leave the cable in the ground than to try to salvage it.

"REA cooperatives in areas where tenant farming is prevalent will be able to provide electricity to low-income families with this new equipment at some benefit to the strength of their entire organization. The consumer density per mile will be increased markedly, and the additional revenue will be more than enough to amortize the cost and meet the small additional maintenance and bookkeeping expense. Of course, the addition of a large number of electrical users, even though they are low-income users, will open up a huge market for manufacturers of wiring equipment, light bulbs and small appliances. Moreover, there is always the probability that at least a few of the users starting with the new services will later be purchasers of larger appliances and will change over to the standard service schedule.

"The development of this new equipment is the result of more than two years of research and negotiation, initiated and stimulated by REA engineers. The equipment now in production has been tested thoroughly and promises exceptionally low maintenance cost. While the price is very low, some of the features appear to be definite advances over equipment sold at many times the price," said Mr. Craig.

Experimental Jobs Planned

Present REA plans call for experimental installations of these new low-cost services on a few projects. These will yield data on which permanent future policies will be determined.

The transformer, meter and circuit breaker shown here have been developed by the Rural Electrification Administration in cooperation with several electric equipment manufacturers with the idea of making electrical service available to thousands of small farm homes that cannot afford the type of service available with conventional equipment.

APPLIANCE Service

Eliminating Moisture from Refrigeration Systems

By Allen Parker

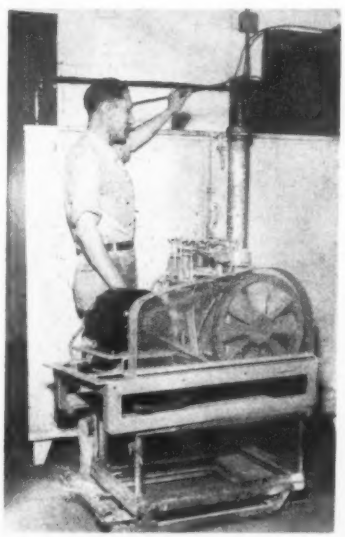
UP to a few years ago, most service engineers were particularly conscious of the disastrous effect which resulted when moisture came into contact with the internal workings of refrigeration equipment. Most of these early type units used sulphur dioxide, which has an affinity for water, as a refrigerant. When even the slightest amount of moisture is mixed with sulphur dioxide, sulphurous acid is formed which immediately attacks the metal, causes the expansion and float valve and compressor suction and discharge valves to corrode and stick, and if the moisture is present in sufficient quantity only a few minutes will elapse before the pistons will stick so fast that they will have to be driven out with a press. Not infrequently the motor will burn up when the compressor reaches this condition.

It was only natural that the service man was particularly alert in his effort to keep moisture from the system for a mistake would inevitably mean complete disassembling of the entire system, washing and removing sludge, gum and carbon, buffing off the corrosion and burnishing each individual part before reassembling and baking to completely dehydrate it.

Undoubtedly, such difficulties as those described above, played no small part in popularizing such refrigerants as methyl chloride and freon. Certainly, they do not present such an acute problem and I am wondering if, as a result, many service men may not have grown lax in their precautions to prevent moisture from entering refrigerating systems.

Moisture mixed with freon or methyl chloride will not result in an immediate breakdown of a refrigeration system unless a very large amount of moisture has entered the system. However, it can be the cause of nagging, troublesome problems.

Usually, the first noticeable effect of moisture in systems using the halogenated hydrocarbon refrigerants is the plugging of expansion valves. This results from the fact the moisture frees itself and freezes into a solid, restricting the orifice. If the expansion valve is heated slowly and carefully so that the ice will melt, the refrigeration unit will again function but a repetition of the trouble will occur unless the moisture is removed.



This 1½ hp refrigeration compressor has just been overhauled and is ready for re-installation. A large piece of pipe 3 inches in diameter and about 3 feet long has been made into a dryer. When the job is installed, any moisture accidentally let in will be eliminated by the dryer

Also, it may surprise some service engineers to know that if moisture is allowed to stay in contact with the halogenated hydrocarbon refrigerants, it will slowly react with the water to form hydrochloric and hydrofluoric acids. The seriousness of such action depends, of course, upon the operating conditions such as the period of time that the moisture remains in the system, temperature, etc. Such acids in present day refrigeration systems will soon cause loose bearings, leaking seals, pitted needles on float expansion valves, and may even stick the piston or rings. Also, corrosion leaves a residue of solids composed of metal salts and oxides which can soon make the compressor valves inoperative and increase the friction of other mixing parts. Another effect will be corrosion forming on heat transfer surfaces such as the walls of the coils and condensers which will materially reduce their effectiveness. The action of the acid on metal will cause noncondensable gas to form such as hydrogen and this will be troublesome to a small degree.

Oil deterioration is another trouble that always accompanies moisture in a refrigeration system. Not only is its lubricating value reduced considerably but there are other types of oil trouble that will result from moisture. It is a known fact that most lubricating oils will dissolve a small amount of copper from the lines or the copper alloy fittings. As long as this copper is held in suspension, there is not much trouble to be expected. And the moisture or acid in the system does not appear to accelerate the dissolving action of the oil. However, with moisture in the oil and with changing of temperature in the running cycle, it does appear to throw the copper out of suspension with the result that the copper clings to the walls of the equipment, pistons, valves, etc. It becomes a source of unending trouble as the copper plating begins to build up and cause such difficulties as compressor sticking.

These facts should be convincing evidence that moisture in methyl and the freons is equally as serious as moisture in sulphur dioxde even though its action is not as acute at

the beginning. And it is well to remember that trouble can begin with a moisture content of as low as .01% by weight.

Let us next consider how moisture usually gets into a refrigeration system and the best means of eliminating it. Some service men are of the opinion that moisture in most sulphur dioxide installations is taken in through a leak on the low side of the system, such as a leaking joint or defective shaft seal, and that since the low side on methyl and freon systems are usually operated above atmospheric pressure, there would not be much likelihood of moisture entering the system. However, it is entirely possible that while working on a job, the service man will unconsciously let enough moisture in to give trouble.

For example, many service men do not give attention to the moisture content of the refrigerant they use for replacement purposes. They believe that the manufacturer should take care of that condition and of course he should. Unfortunately, moisture content is not always held sufficiently low in refrigerant manufacture. One reliable manufacturer has a test sheet attached to each drum of refrigerant showing the moisture content of that drum, thus assuring the service engineer of the safety in using that drum so far as the possibility of letting moisture into the system is concerned.

The oil used by the service engineer may be another source of moisture trouble. The oil refineries do not give the moisture content in oil in percentage by weight but specify a dielectric test. Oil passing a test of 30,000 volts minimum in a standard gap can be considered safe and as having moisture content not exceeding .01 per cent by weight. However, a very slight decrease in the voltage test may indicate a considerably greater moisture content. In my opinion, oil absorbs most of its moisture after it leaves the refinery. My suggestion is that you keep your oil in a moisture tight container provided with two openings. One opening should be used to pour the oil while the other should act as a breather tube which might be connected in series with a drying agent so that the air entering the can, as the oil is removed, will be moisture free. Never leave the oil open to the atmosphere.

Other Means of Entry

Of course, there are other means by which moisture may gain entrance to the refrigerating system. The unit may not have been completely dehydrated and evacuated during assembly. Or moisture may have entered during the installation of parts in the field. Again, bad gaskets on cylinder heads, slow leaks in brine tanks or water cooled condensers, may have been the source of trouble. All of these are means by which moisture may enter systems that we have always considered having back pressures high enough to maintain them moisture free.

Once moisture gets into the refrigerating system it is going to give trouble and the next problem is to decide upon the best method of eliminating it. When I encounter a system in which I suspect there is considerable moisture such as might enter as the result of a leak in a brine tank, water condenser coils, cracked cylinder head, etc., I first discharge the refrigerant from the system, bring the equipment into the shop and completely disassemble it, wash it out including the cooling coils with carbon tetrachloride, and then reassemble and bake it out in an oven at about 250 degrees F. for several hours, pulling a vacuum on the equipment of about 29 inches. After this, the unit is ready for reinstallation and recharge with refrigerant and oil.

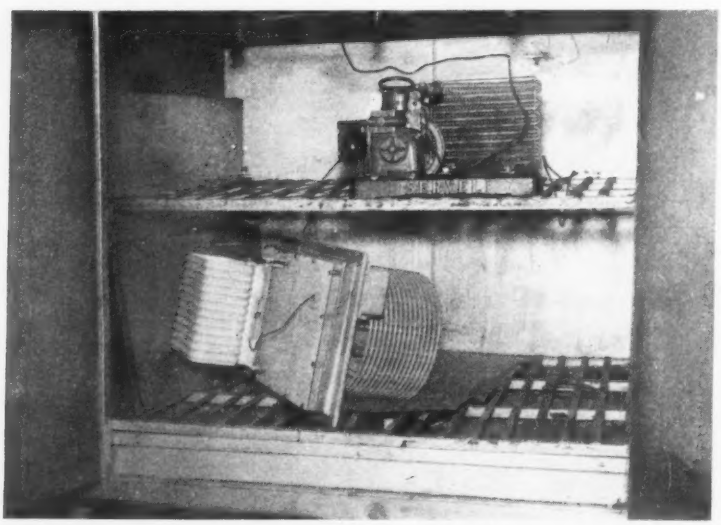
On the other hand, many of the moisture problems that the service engineer will encounter will be of the type that have just enough moisture to cause occasional trouble such as a plugged expansion valve, which of course would not warrant the expense of the above procedure. These are the cases where the use of solid chemical drying agents may be used to advantage.

Using Drying Agents

The drying agent should be placed in a piece of pipe or tube with the diameter sufficiently large so that there will be no great amount of added resistance to the flow of the liquid. The capacity of the drying pipe should also be large enough to reduce the velocity of the refrigerant so that it will have more time to come into contact with the drying agent. Care should be used in assembling the dryer so as to be sure that the drying agent is sealed in at both ends with a filter which will prevent any of the drying agent from becoming free in the system. Spun glass, mineral wool or felt, backed up with a fine mesh screen will serve this purpose very nicely.

There are several drying agents available that will work satisfactorily; each having some claim to advantage over the other. My suggestion would be to take your choice between calcium oxide, drierite, activated aluminum or silica gel.

(*Continued on page* 40)



In this oven a refrigeration unit is connected to a vacuum pump and is being evacuated as it is baked to remove all traces of moisture before re-installation. Also, a sealed unit is being dehydrated after a leak has been repaired on the low side.

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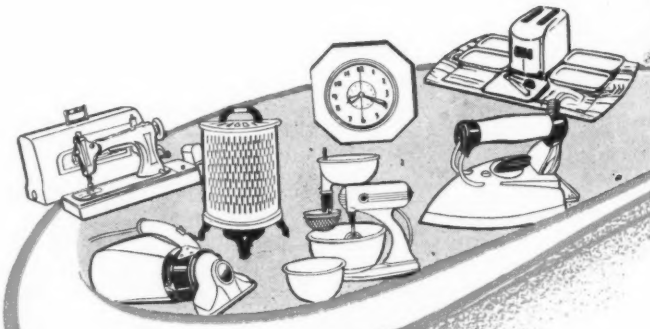

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MOTOR Service

Connecting Diagrams for Lap Wound Motors

Part 4

By A. C. Roe

Railway Motor Engineer
Westinghouse Electric & Mfg. Co.

WITH this article are presented the four-pole, four-parallel connecting diagrams with standard number of leads. We will also discuss the small diagrams used with each connecting diagram.

In the center of each connecting diagram there will be found a smaller sketch. This is termed a "schematic diagram." Its function is to explain at a glance the scheme of the main diagram.

All the connecting diagrams basical consist of a number of small arcs, the total being equal to phases times poles, and each arc is numbered. Then for each pole there will be two arcs for a two phase motor and three for the three phase windings. Likewise half the arcs will be in one phase of a two phase winding, and one third in a three phase connection. Thus there are many possible combinations into which these arcs can be arranged and it is desirable to know how the arcs are grouped or arranged in any one connection. This can be accomplished, of course, by checking the diagram and making notes, but by using the schematic diagrams this checking is not required.

The schematic diagrams are made in shape to represent the type of connection such as two lines at right angles to each other for two-phase connections; a "Y" or three lines converging to a common point and 120 degrees apart to indicate the three-phase star connection; or three lines forming a triangle to represent the three-phase delta connection.

Therefore each leg of a schematic diagram represents a phase and then each small circle in all legs indicates a pole phase group. Likewise the start and finish of each leg in the schematic sketch represents the start and finish of a phase.

To construct a schematic diagram, we start with any phase as for example A-phase in Fig. 2 (see July 1939 issue) and place as many circles as there are poles in each leg. Then in each circle insert the group number as we flow through the phase. In Fig. 2 we have groups 1, 4, 7 and 10 in the A-phase leg and for the nine lead dual-voltage connection a break is made between groups 7 and 10. The C-phase leg starts on group 3 and includes 6, 9 and 12, with a break between groups 6 and 9. The B-phase leg starts on group 11, and includes 2, 5 and 8 with the break between 2 and 5. The star connection is formed by connecting the ends of groups 8, 10 and 12 together.

●

THIS is the fourth article of a series that will present 45 modern connecting diagrams for two- and three-phase lap wound induction motors for use on four, six and eight pole windings.

A master table of the 45 diagrams was presented in the July 1939 issue together with the first three diagrams of the series. Figures 10, 11 and 12 of the series appear in this article together with additional explanation of construction and use of the wiring diagrams.

The schematic diagram is really a condensed index for each connecting diagram, as it tells many items at a glance quicker than one could read a written description. For example consider Fig. 3. (See July 1939 issue). The schematic diagram shows that it is for a series delta, four-pole, nine-lead, dual-voltage, short jumper connection, that is, each succeeding group is three numbers higher, that is, 1, 4, 7, 10, etc.

The arrangement of the pole phase groups in each leg of the schematic sketch is also helpful for checking the odd coil groups in windings that have unequal coil grouping. As one can see at a glance which groups are diametrically opposite as 1 and 7, 2 and 8, 3 and 9, etc., Fig. 2 or 3.

A glance at the schematic sketch with Fig. 5 (see August 1939 issue) shows it to be a four-pole, two-parallel star, three-lead, short jumper connection. The dotted lines XX, YY, ZZ, show it is arranged for best magnetic balance and for equalizer connections. This sketch also shows that the tops of groups 2, 4, 6, 8, 10 and 12 are all connected to a common star ring.

The schematic diagrams do not show directly the top to top or bottom to bottom jumper between groups, but the group numbers as 1, 4, 7 and 10, Fig. 5, show the short jumper, and a glance at group 1 of the connecting diagram, Fig. 5, shows the A-lead on the top. From the rule "With short jumpers, the phase starts and ends on the same end of a group," that is, start on top and it will end on the top of a group, it is obvious that in Fig. 5 the A, B and C leads are at the top, and therefore the star connections are at the tops of groups 2, 4, 6, 8, 10 and 12.

The schematic sketch also shows how to convert a star connection to a delta or vice versa. For example, consider Fig. 11 and 12. We want to change Fig. 12 to Fig. 11. We find that groups 1, 4, 7 and 10 are the A-phase groups; 3, 6, 9 and 12 the C-phase groups; and 2, 5, 8 and 11 the B-phase groups. We cut the bottoms of all

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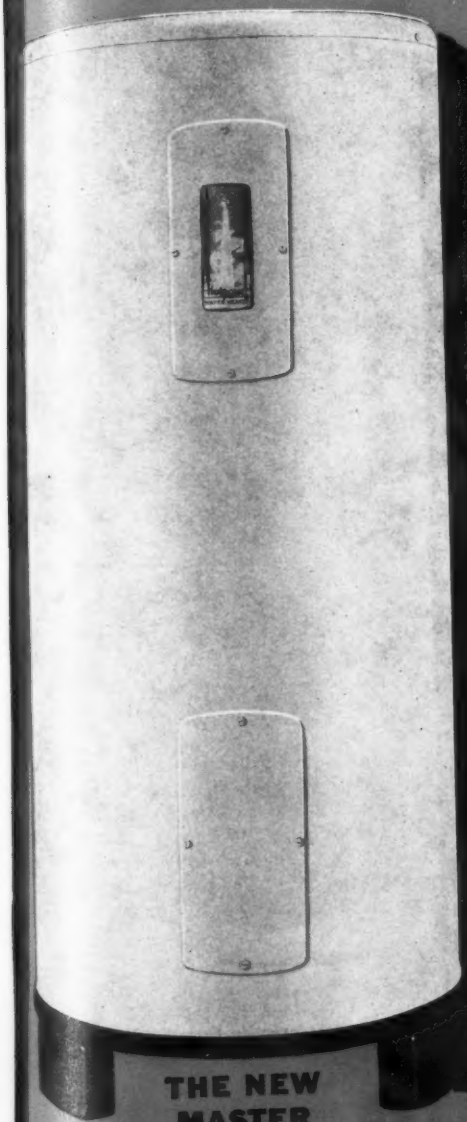

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groups free. This leaves us with the tops of groups 1, 4, 7 and 10 connected to the A lead; tops of groups 3, 6, 9 and 12 to the C lead; and the tops of groups 2, 5, 8 and 11 to the B lead. We then connect the bottoms of all groups to a common star ring and we have a four parallel star connection like Fig. 11.

Or by comparing Figs. 2 and 3, (see July 1939 issue) the schematic diagrams indicate the fundamental differences between the star and delta type of three phase connections. In Fig. 2 the current flows toward the star connection, whereas in Fig. 3 the current flows around the triangle. The schematic sketch shows that for a star connection the ends of all three phases are connected together to form the star point, whereas in the delta connection the end of A-phase connects to the start of C-phase, the end of C-phase connects to the start of B-phase, and the end of B-phase connects to the start of the A-phase.

The schematic diagrams can be

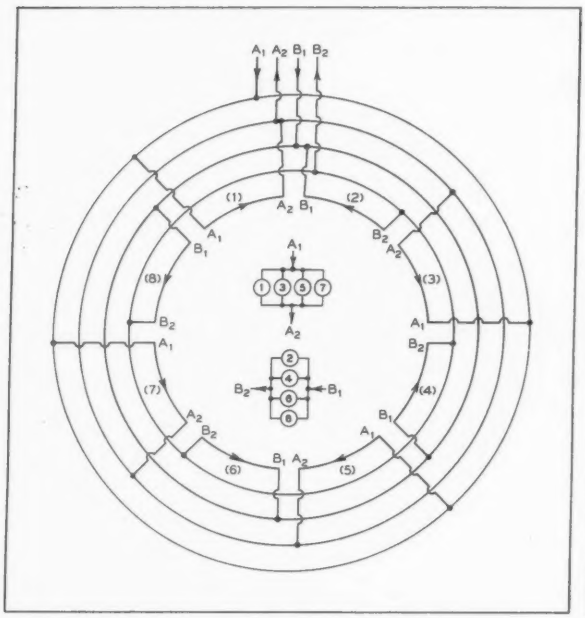

Fig. 10. Diagram for 4-pole, 2-phase, 4-parallel connection.

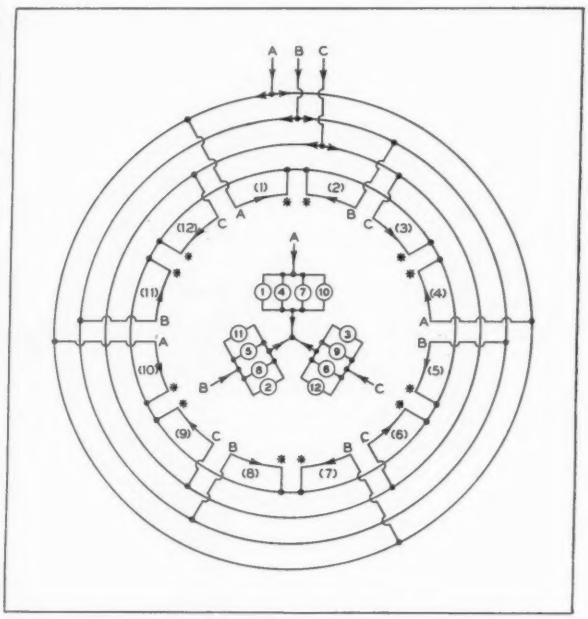

Fig. 11. Diagram for 4-pole, 3-phase, 4-parallel star connection.

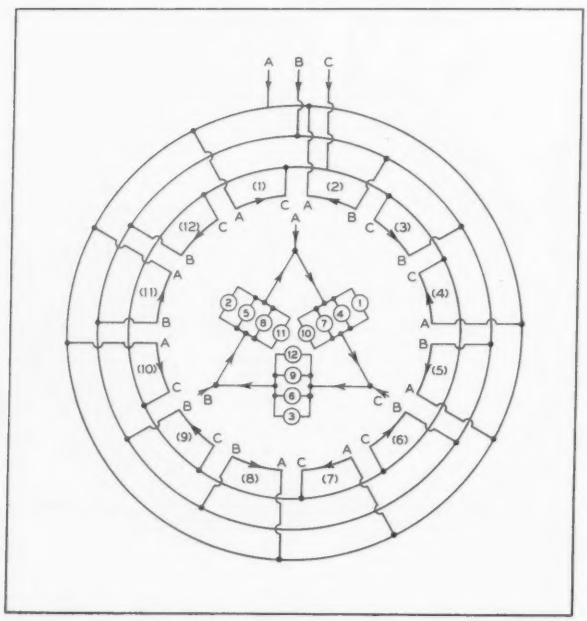

Fig. 12. Diagram for 4-pole, 3-phase, 4-parallel delta connection.

used in checking the nine-lead winding to determine whether it is a star or delta connection. The small schematic diagrams show that the star connection in Fig. 2 is divided into four separate sections, three will have two leads while the fourth section will have three leads. These can be found with a test light. The schematic diagram for Fig. 3 shows the delta connection divided into three separate sections of three leads each. Thus one can tell without removing an end bracket whether a motor is star or delta connected.

Last month we recommended that the group markings be copied in a note book for use where a diagram is not available. We also suggest that small schematic sketches be added to the note book as they will be found quite useful to check connections and windings in the field. They can also be used in conjunction with the group markings and layout to make up a diagram on location.

A rough schematic diagram can be made from a winding of which a connecting diagram is not available, and it can be used later to construct a working connecting diagram. The first step is to determine the number of poles, phases, type of connection and whether it is series or parallel. Then make up the skeleton schematic sketch, that

(*Continued on page* 68)

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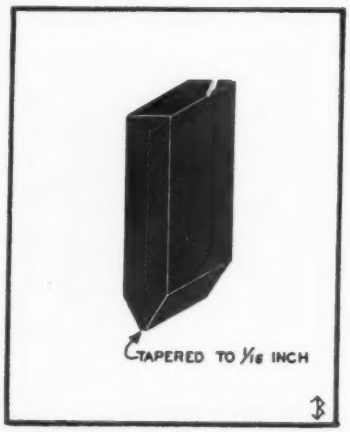
Correct Brush Settings for Repulsion-Induction Motors

By Jack Beater

INCORRECT brush setting is the direct cause of much poor performance in many repulsion-start, induction-run motors. Brushes that are even slightly out of position will cause arcing, excessive brush wear, burning of the commutator and loss of starting torque. Many motors that have been repaired or rewound fail to deliver the expected service only because the brushes are not located in the correct electrical position.

It can be taken for granted that practically all new motors have the brushes properly located when they leave the factory, but not all motor manufacturers take the trouble to mark the brush ring and the frame with easy to recognize index marks. Many do but some do not, and if the motor is taken apart without first checking up on the index marks the chances are, when index marks are not present, that the motor will be reassembled with the brushes more or less out of position.



Adjustment of neutral position of brushes is facilitated by the use of special brushes beveled as shown here which make contact with only one commutator segment at a time.

Check Index Marks

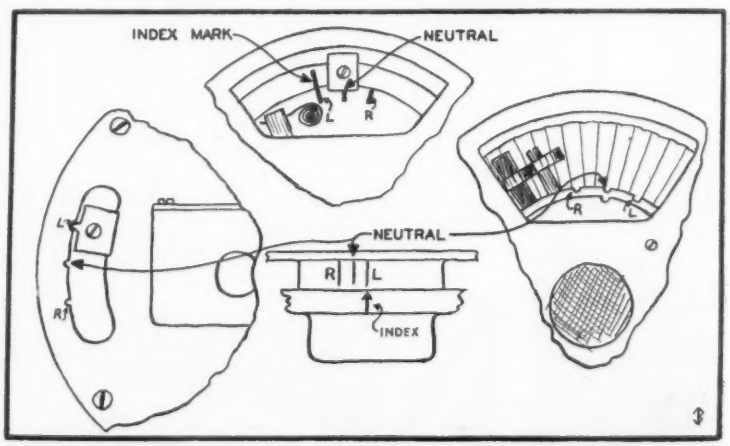
Even when clean cut index marks are present they are not reliable if the rotor has been rewound. The commutator may be on the shaft in a slightly different position, or the winder may have replaced the winding connections one bar to the right or left of the original installation. In such cases it is obvious that the original marks can not be relied upon. Therefore the best and safest plan is to check the brush setting on every motor of this type before it leaves the shop, whether it is just an ordinary repair job or a complete rewind.

Most manufacturers of motors having an adjustable brush ring mark the ring or the housing in three positions. The left hand mark is for right hand rotation (as viewed from the drive end) and the right hand mark is for anticlockwise rotation, also viewed from the drive end. The central mark is to designate the neutral position. In the exact neutral position the motor will not start in either direction of its own accord but will run in either direction if started by hand.

While the brushes are never set on the neutral position when the motor is in service it is still a very important factor to have it marked correctly. The importance of knowing the exact neutral position increases with the number of poles in the motor. The reason is fairly obvious, for if the neutral mark is wrong then the marks for right and left hand rotation will also be wrong. To set the brushes correctly for either rotation we must have a neutral position that is known to be right.

Due to differences in design and construction the index marks will be found in different places and on different parts of the motor assembly. Some popular motors have the marks stamped on the end frame of the motor. A pointer attached to the adjustable brush ring indicates when the brushes are in the right position for either rotation. On other motors the three marks—left rotation, neutral and right rotation — are stamped directly on the brush holder plate, and a single index mark is stamped on the motor housing or end frame. In either case the brush plate is shifted until the desired position is obtained. Some few motors have only two marks, one for each rotation, and the neutral position is half way between.

Some few motors have end frames that are exactly positioned against the main frame by means of a dowel pin, but in the majority of motors it is possible to assemble the commutator end frame with a swing to the right or left of its true position. When the index marks are stamped on the end frame this may result in assembling a motor with the neutral and running marks considerably out of the correct position. With motors held together by through bolts this is easily done, and the exact position of the end frame is often hard to determine accurately. This is another good reason why the neutral mark should be checked on every motor before it



Typical methods of marking neutral brush position.

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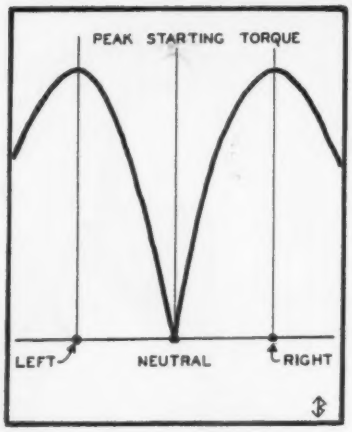
Finding the exact neutral position of the brushes on the commutator is rather delicate work but can be accomplished without elaborate equipment in a few minutes. The surest method is to install a special set of brushes kept for the purpose. These brushes have the working edge beveled to a narrow ridge as shown in the illustration. The contact surface of the brush is held to about a sixteenth of an inch in width so that contact can be made with only one bar, whereas brushes of the normal width may contact several bars at the same time.

With a set of the narrow edged brushes in the holders, move the brush ring to what is thought to be the neutral position. In the exact neutral position, the motor should hum when normal current is applied to the motor terminals, but the rotor should make no attempt to revolve in either direction. A little movement to either side by the brush ring, however, should cause the motor to start in that direction. When the exact neutral position is located, the setting should be checked against the neutral mark stamped on the motor. If the neutral position is different than the original mark, a new neutral mark should be made with a centerpunch.

Let us suppose that the real neutral position of a rewound motor is found to be ⅛ inch to the left of the original mark. If this is true, then the correct running positions, right and left hand, will also be ⅛ fo an inch to the left of the original marks. New marks should be made and the old ones obliterated. On undoweled, through-bolt motors a small variation in the line-up of the index marks can be made by loosening the through bolts and driving the end frame in the required direction until the marks line-up correctly.

Another method of checking correct brush placement, a method especially useful for use on motors having the brushes held in non-moveable cartridge type brush holders held in the end frame, is as follows: Clamp motor in vise or bolt to bench, connect motor to line with an a-c ammeter in series, run motor with brushes set for clockwise rotation, hold motor speed down to about 50 rpm with a rope or brake on motor pulley. Take ammeter reading, then repeat the test with brushes in anti-clockwise position. If properly set the ammeter readings should be the same for either rotation. A high reading for one rotation and a low reading for the other rotation shows that the brushes have not been located an equal distance each side of neutral. Of course, in using this test method, it is important that the rpm be exactly the same for each rotation test.



The effect of brush setting on starting torque is shown by this curve. At true neutral position no torque is developed. With brushes moved either to right or left, a point will be found where starting torque is a maximum. Of course, direction of rotation is changed as the brushes are shifted from one side of the neutral position to the other.

The way in which a motor starts under no load conditions is no indication that the brushes are properly set. Many shops send a motor out as properly adjusted because it seems to have a snappy start when thrown on the line in an unloaded condition, and some of these motors will come back in a damaged state within a few days because they are unequal to the task of starting a full load efficiently. Checking up on brush settings will go a long way in eliminating comebacks and making motors operate satisfactorily.

Eliminating Moisture In Refrigerators

(*Continued from page* 32)

It may be well to point out that not all drying agents have the same reaction in removing water. For instance, the type such as calcium oxide actually reacts with water and forms a new chemical state, that is, it changes from calcium oxide to calcium hydroxide. On the other hand, a drying agent such as calcium chloride or silica gel actually absorbs the water in much the same fashion as a sponge.

Some refrigerant manufacturers recommend certain drying agents, which are included in those mentioned above, for their particular gas and in such cases I would recommend, of course, that you follow their instructions. In the past, calcium chloride has been almost universally used but I would not recommend its use any more because it disintergrates very rapidly, being soluble with water to form a corrosive brine that may damage the system. The best results from a dryer can usually be obtained by installing it in the liquid line which removes the moisture before it reaches the expansion valve. Installation in the liquid line is also desirable because pressure losses are made negligible.

Removing moisture from a sulphur dioxide system has not been mentioned and undoubtedly many service engineers will not believe it is practical to remove it with a dryer, anyway. Sulphur dioxide gives such short notice of the presence of moisture in a system that the damage is usually already done and the machine sticking before it becomes known and the dryer may be applied. While the use of a dryer may not be worth while in such instances, consideration should be given to their use on jobs that have been repaired and on which moisture corrosion has been noticed on the compressor valves, pistons, etc. Such a dryer installation may save an overhaul job later.

On new refrigeration installations it certainly would appear to be good insurance to make certain that no moisture will threaten its performance. Another helpful idea in drying sulphur dioxide is to keep in mind the fact that sulphur dioxide has such an affinity for water that the moisture can best be removed after the sulphur has vaporized and passed on leaving the moisture behind which will be slow in leaving the evaporator. Obviously, the logical place to install the dryer on the sulphur dioxide system is on the suction line. It should be installed vertically so as not to trap the oil returning to the compressor and the discharge end should be at the top so that it will always be full of liquid thus giving maximum contact with the drying agent.

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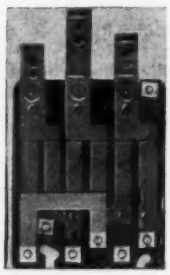
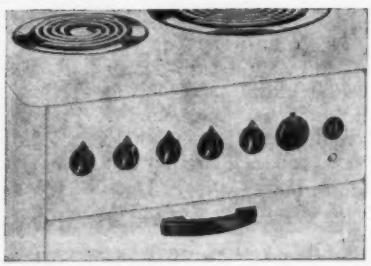
SETS AMAZING RECORD RANGE PERFORMANCE!

Confirmed in 8,004 United States Housing Authority Dwellings

stalled 8,004 Hotpoint Electric Ranges (each with 3 alrod surface units) in 13 different housing projects roughout the U.S. • Of the 24,012 Calrod units (48,024 oils) only one COIL has failed in service. Better than 99 88/100% perfect performance at the hands of low income families in Slum Clearance areas. Such performance under severe usage is your assurance that you and your customers are best protected by Hotpoint.





1 **You can't wear out the new Hotpoint Switches.** Hotpoint research amazed the electric industry with its new Slow Make and Break Switches. Result is a switch that will operate for years without failure. Severe laboratory tests have proved this durability. Field use verifies it.

Hotpoint engineers claimed 60,000 cycles for their new switches under full range load. Electrical Testing Laboratories, with independent tests, proved that 68% of the new Hotpoint switches tested by them passed 200,000 cycles under 20 amp. load. Equal to nearly 50 years of normal use.

All Hotpoint ranges are completely equipped with these remarkable Hotpoint-built switches.

2 Hotpoint introduced the 5-Heat Switch with Slow Make and Break Contacts and again raised the Standard of Electric Range Performance. Hotpoint leadership means more to you than a mere term. It makes sales easier.

3 There are approximately a quarter million of Hotpoint's new switches in use today. Their performance is 99.92% perfect—setting a new high standard for long life in switches. There is no need to ask your customers to be satisfied with less.

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc.
5614 West Taylor Street, Chicago, Illinois

Over ⅓ of all electric ranges in use today are Hotpoint—far more than any other make. For more than 30 years Hotpoint has led the industry with research, engineering, electric range improvements. Hotpoint means advanced features. The name Hotpoint on an electric range is a great sales asset. It's easier to sell Hotpoint than to sell against it.

Electric Ranges

REFRIGERATORS • WATER HEATERS
DISHWASHER-SINKS • WASHERS and IRONERS

Hotpoint offers a lively new Christmas sales plan. Use it to cash in on the momentum gained in the big Range Exposition Campaign. Get all details from your Hotpoint Distributor or District Representative.

NEWS of the INDUSTRY

Dealers

Range Promotion Gets Under Way

A brand-new electric range promotional program with plenty of popular appeal is being offered to utilities and dealers for fall use by the Modern Kitchen Bureau, announces H. L. Martin, bureau manager.

This program is expected to prove particularly sales-worthy because of several natural elements that went into its making. One of these is that it capitalizes on the fact that Americans like expositions and that this is an exposition year.

The name, National Electric Range Exposition, it is believed, will prove a powerful magnet in attracting the hometown folks to stop, look, and see.

Next, the theme for the exposition has been chosen with particular care. It is: "Change to **clean, safe** electric cooking now that it is **fast** and **cheap.**"

The reason for the choice of this particular theme rests on a recent coast-to-coast survey, made to discover why women do—or do not—buy electric ranges.

The survey disclosed that they buy electric ranges because electric cooking is clean . . . because electric cooking is safe. They hesitate to buy because they think electric cooking is slow and costly. They do not yet realize that electric cooking is actually fast and cheap.

Around this theme and the exposition idea the bureau has created a three-phase promotion. The first phase of the promotion concerns itself with display.

Here the bureau provides a large sales banner to be used as the curtain-raiser for the dealer or utility's own show. It announces the Exposition, dramatically presents the theme, and invites prospects to visit the store display.

Another display aid consists of store arrows — colorful, brief pointers that can be strung on wires leading from window or door to the inside floor display. They take up where the banner leaves off, repeat the sales message, guide prospects right to the floor samples where salesmen can get in their best licks.

The second phase of the bureau's promotion takes the salesman into consideration. Here, a selling guide, giving a step-by-step method for effectively presenting the sales story, is provided for use in sales training. Methods and suggestions for building store displays are also provided by the bureau.

The third phase of the promotion is *outside the store,* and for use here the bureau is providing radio spot announcements of from 20 to 100 words, newspaper advertisements, and a hard-hitting, prospect-getting direct mail campaign.

Alabama Sales Spurt Upwards in July

Electric appliance sales in July by the Alabama Power Company and dealers on its lines totaled $562,000 or slightly more than 25 per cent of the entire volume of $2,000,000 sold by dealers and the company during the first seven months of the year. The sales pace continued during August.

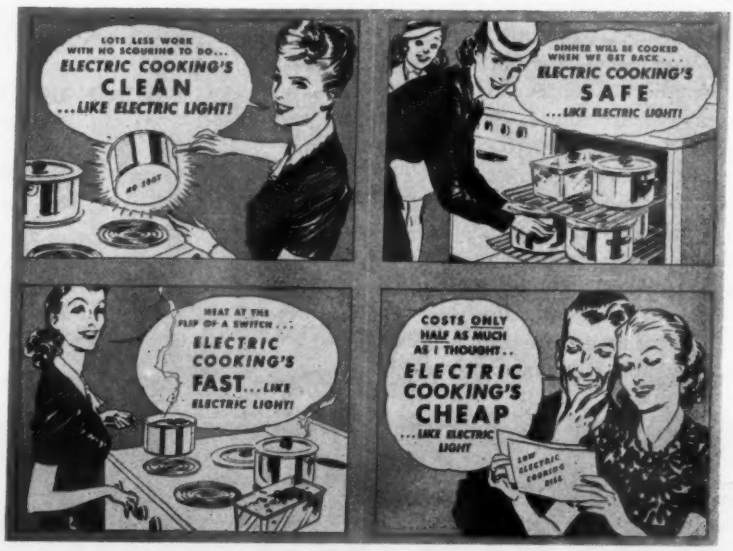
The company reported this is an all-time high of electrical appliance sales in its history. It attributes this volume to low rates at which these appliances may be used, and to the intensive sales training program it conducted.

The sales volume of electrical appliances for the year in the area served by Alabama Power Co. is expected to be between three and one-half and four million dollars.

Georgia Salesmen Win World's Fair Trips

Twenty-six of the twenty-seven free trips to the World's Fair offered by Georgia Power Company in its "Head Start Merchandise Campaign" were won by champion sales people. Only the home laundry department failed to produce a campaign winner. Company sales of appliances in the campaign totaled $757,507 or 94.69 per cent of the $800,000 quota objective.

Jack McDonough, Rome division manager, won the trip offered the leading division manager in the campaign. Temp Davis, of Rome, and Frank Dodd, of Augusta, won the two trips offered division sales



Cleanliness, safety, speed and economy are the features claimed for electric ranges in MKB's "Electrical Range Exposition."

Waiting for you . . . in Georgia

90,000 PROSPECTIVE CUSTOMERS

For Better Home Lighting

New electric rates of this Company have created an almost irresistible opportunity for Georgia families to provide their homes with the kind of light they have always wanted. With "Free Electricity" provided in the new rates—90,000 Georgia homes out of 170,000 on our lines can use the current needed to add an I. E. S. lamp, or its equivalent in better light, *at no increase at all* in their monthly electric bills. Tens of thousands more can perform the same self-service at a cost so low that even the keenest eyes couldn't find its tiny dent in the family budget.

Electrical dealers in Georgia are bound to feel the sales-making effect of this new situation—and of the intensive state-wide campaign now being waged by us to carry this story into every one of the Georgia homes we serve.

Georgia Power Company

October Special

Model "9" Eureka
Vacuum Cleaners

$6.95 each

Fully Guaranteed

Catalog upon Request

Talley Vacuum Cleaner Co.

510 S. Tryon St., — Charlotte, N. C.

WE BUY — SELL — RENT

V-C NEW AND REBUILT MOTORS

REBUILT MOTORS AND GENERATORS

Motor Rewinding For The Trade

V-C ENGINEERING CO., INC.
1004 Main St., Norfolk, Va.
Write for Catalog 175

EXTRA Values Speed Demand for the NEW CORY Coffee Brewer

REG. U. S. PAT. OFF.

- New streamline design
- Wide-neck, easy to clean
- Steadier-standing
- Matched de luxe equipment included in price
- All electric units 2-heats (Hi-Low)

Free!

THE SENSATIONAL NEW CORY GLASS ROD FILTER

IN ADDITION TO CORY "FAST-FLO" FILTER

BOTH FILTERS ARE SPEEDY! NO METAL! BREW MARVELOUS COFFEE AND TEA

Sensational Records Prove CORY Sturdiness

At the N. Y. World's Fair, 910,000 cups of coffee were served at one eating place in 70 days with glass breakage of only 17 pieces! A triumph for CORY compact streamline design and special-formula CORNING glass. Stands up under *heat* and *service*. Modern and easy to clean! It has caught the public fancy.

Big Profit Opportunities

In CORY Brewers and CORY Glass Filter Rods

CORY RODS fit other brands of glass coffee brewers and make them *all* glass. Brew superb coffee and tea *untouched* by *metal*. Selling in vast quantities at 50 cents. An extra value with all CORY Brewers.

Other EXTRA CORY values are: Complete de luxe equipment *included in price*. Buyer gets: Hinged Decanter Cover, Combination Cover and Stand for Upper Glass, Measuring Cup. These fittings and easy grip Handle are in matching ivory-tone Bakelite or Black Durez. Over 14 superiorities in all. Write *for catalog*.

GLASS COFFEE BREWER CORPORATION
325 No. Wells St., Chicago, Ill.

supervisors.

Other winners included G. L. McWilliams, Atlanta; N. A. R. Lawrence, Augusta; Carlton Wicker, Rome; Sam Strauss, Statesboro; Dave Pressly, Canton; H. D. Everett, Jr., Statesboro; Joe Wheeler, Canton; Jimmy Bolton, Tifton; F. A. Baker, Brunswick; W. W. Moore, Gainesville; C. J. Bass, Atlanta; Nat Carswell, Atlanta; W. H. Sharpe, Decatur; Frank Hayley, Atlanta; W. H. Austin, Atlanta; Rupert Hobbs, Rome; P. E. Talley, Macon; J. B. Barrow, Augusta; Mac Pickard, Columbia; G. W. Joiner, Athens; G. G. Brantley, Dahlonega; Pete Rivers, Metter; and Miss Nora Donahoo, Columbus.

Electrical Appliance Club Organized

Henry H. Tucker, president, Fones Bros. Hardware Company, of Little Rock, Arkansas, was elected president of the newly organized Electric Appliance Club of Arkansas.

Other officers named at the first meeting were John H. Hunt, vice-president, Bush Caldwell Company, Little Rock, who will serve as vice-president of the association; and Frank Burke, sales manager, 555, Inc., who was elected secretary-treasurer.

Organized as an association for all wholesalers and retailers in electrical appliances in Arkansas, the club will have as its sole purpose the promotion of greater sales of electrical appliances to the public.

New Firms, New Stores, and New Lines—

Jones-George Electric Company, Aiken, S. C., has just finished remodeling their office and show rooms, with a complete new arrangement of stock, new equipment and fixtures, all wired for display.

Mr. Jones states that their stock is now complete and sufficient to meet the demands of the people of Aiken County. A complete line of refrigerators, ranges, fans, air-conditioners, small electrical appliances, and a modern radio service department are included in the new store.

The Phelps Refrigeration Company opened for business recently in a new location at 515 S. Tryon Street, Charlotte, N. C. Headed by W. L. Phelps, this concern handles the Hotpoint lines of households refrigerators and ranges and other appliances.

Charles E. Walker, who for several years has been in charge of electrical appliance service for the Tennessee Electric Power Company, has been appointed authorized service agent for Frigidaire in Columbia, Tenn.

* * *

The Cowan Electric Company of Dublin, Texas, has moved to a new location in the Utterback Building.

* * *

Hubert Hightower's, a store featuring electric refrigerators, radios, and other household appliances has opened in the Henderson Building on College Street, in Sulphur Springs, Texas. Freeland Walker, well-known local salesman, has been employed as manager of the new firm which also has a store in Mt. Vernon.

* * *

Robert Waller and Lawrence White, well-known Murfreesboro, Tenn., business men, have announced the formation of the Waller-White Company to handle electrical appliances of all kinds. The company will be located in the former district office of the Tennessee Electric Power Company and will also operate an appliance repair shop on South Walnut Street.

Mr. Waller, who has had sixteen years experience as merchandise salesman and district merchandise manager with the Tennessee Electric Power Company, will be in charge of sales. M. R. White, who was for ten years district service manager with the same company, will be in charge of service.

* * *

Roten and Jeffers Modern Appliances is the name of a new firm opened recently in Hamilton, Texas, in the Perry National Bank Building by W. C. Roten and Francis Jeffers. The company will stock a complete line of electrical household appliances featuring Hotpoint products.

* * *

Joe Morris, who for several years was connected with the Tennessee Electric Power Company as appliance salesman and service man, has opened an electric appliance service shop in Waverly, Tenn.

* * *

The F. and S. Electric Company, of Bassett, Virginia, a recently organized partnership between O. W. Franklin and J. Ralph Stafford, has purchased the electric department of the Southern Sales Company and will operate it as an electrical appliance sales and general electrical contracting business.

* * *

The Wilbur Jackson Furniture and Appliance Company of Chatsworth, Ga., opened its doors to the public early in September in the Shelton Building on Market Street. The building has been completely remodeled and enlarged especially for the new business.

Featured in the appliance division of the store will be the complete line of General Electric, Norge and Easy household appliances.

The Bennett Electrical Appliance Company of Hot Springs, Ark., has just moved into new quarters in a completely remodeled building located at 1312-16 Central Avenue. Bennett Company, which has been operating for nearly three years, has augmented its appliance stock to include a wide range of Maytag, Norge and Philco appliances.

* * *

The Bradfield Electric Company, of Rome, Ga., recently announced the addition of commercial refrigeration service to its business. New and used commercial fixtures, air conditioning and repairs for all types of electrical refrigeration equipment will be featured by the company.

* * *

The Taylor Electric Company of Williamston, N. C., has recently been named exclusive dealers in that section of North Carolina for Frigidaire refrigerators and electric ranges. J. D. Taylor is general manager and proprietor of the company.

Florida Dealers Make Good Showing in August

Figures compiled by Florida Power & Light Company show that Miami dealers did a sizeable amount of business during the month of August. Part of this is due to increased interest in electrical appliances brought about by the distribution in July of $3,600,000 rate rebate to Miami subscribers by the Florida Power & Light Company. The psychological reaction was that electricity must be cheaper now if there was such a substantial refund over old rates, and that it would pay to use more, particularly in the kitchen. Here are the figures for dealer sales for the month:

Lamp bulbs	38,263
Lamps, floor and table	1,953
Wall lamps	95
All other lamps	2,212
Home ventilating fans	1
Air conditioning units	2
Domestic refrigerators	714
Ranges	229
Water heaters	6
Home water coolers	1
Radios	1,523
Toasters	671
Percolators	575
Waffle irons	185
Roasters	89
Grills	202
All other table cookery	172
Irons	1,057
Ironers	15
Heating pads	39
Sun lamps	20
Vacuum cleaners	175
Washing machines	157
Fans	857
Mixers	212
Domestic pumps	18
Clocks	407
Sewing machines	102
Other motor driven devices	142

Contractors

Contractors Hold Annual Convention

Electrical contractors from all parts of the United States gathered in Philadelphia, at the Bellevue-Stratford Hotel, for the thirty-seventh annual convention of the National Electrical Contractors' Association, on October 9, 10, 11 and 12.

Following an address of welcome by Horace P. Liversidge, president, Philadelphia Electric Company, and the address of the association's president, Earl N. Peak, the Monday morning session was occupied with reports by divisional committeemen on association and business conditions throughout the country.

The Monday afternoon meeting featured a closed session for NECA members exclusively, employing members of International Brotherhood of Electrical Workers. Among the speakers addressing this meeting were E. C. Carlson, chairman of NECA Labor Relations Committee; D. W. Tracy, president, I.B.E.W.; L. K. Comstock, chairman, Council on Industrial Relations for the Electrical Construction Industry; and Earl Whitehorne, of McGraw-Hill Publishing Company.

"Wasted Watts" was the subject of J. Walter Collins, secretary of the Electrical Contractors Association of Chicago, who opened the Tuesday morning session. He was followed on the program by Ray W. Ashley, of the Research Department of the same association, who spoke on "Neglected Costs." "Competition and the Law" was the subject of Walter J. Walsh, attorney of San Francisco. His address was followed by a general forum hour for discussions by all contractors in attendance.

Selling Features Program

"More Effective Selling the Key to Electrical Contracting Business" was the subject of an address by Howard Williams, vice-president, Tradeways, Inc., at the Wednesday morning session. George Andrae, NECA member on electrical committee, N.F.P.A., also addressed this session, discussing the proposed code changes in relation to the electrical contracting business.

The Wednesday afternoon session featured another closed meeting for NECA members exclusively employing members of I.B.E.W. Also heard at this meeting was a report from field representative Paul M. Geary, of NECA Labor Relations Committee.

Two addresses were presented at the concluding session Thursday morning. F. Stuart Fitzpatrick, manager, Construction and Civic Development Department, Chamber of Commerce of the U. S., spoke on "Mobilizing the Construction Industry." "Home Building for the Low Income Brackets" was the topic of Joseph O'Brien, director of Electrical Research, John B. Pierce Foundation.

White Heads Georgia Contractor Group

Headed by K. D. White, of Atlanta, as president, all officers of the Georgia Electrical Contractors' Association were re-elected at their annual convention in Macon, September 14.

Other officers include T. H. Fulton, of Atlanta, vice president; W. R. Puckett, of Atlanta, secretary-treasurer. Approximately 40 representatives attended the meeting.

The next general meeting of the state association will be held in the fall, the date and place to be decided later.

Speakers included L. E. Kite, executive secretary of the North Carolina Electrical Contractors' Association; H. E. Smeeten, Atlanta, of the Georgia Power Company; T. F. Fleisher, of Atlanta, and D. B. Clayton, district committeeman.

Durham Settles Outlet Controversy

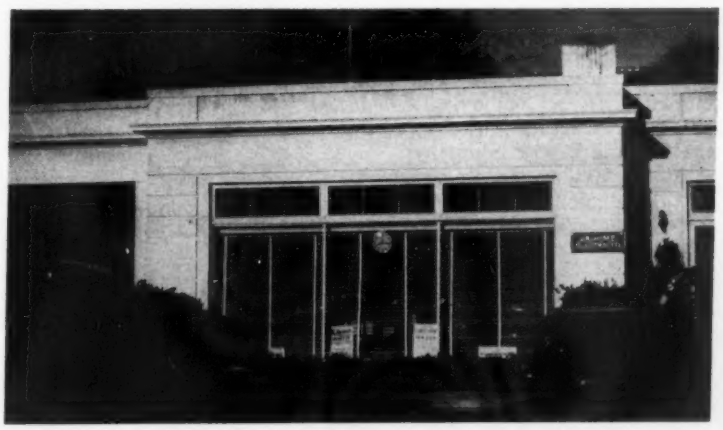
Long controversy over the provisions of the city electrical code at Durham, N. C., were ended September 5 when the city council adopted a revised ordinance cutting in half the number of baseboard outlets required in homes. Numerous citizens had protested that the old ordinance, which required an outlet for every 20 feet of baseboard, was too exacting. The matter has been before the city council for several months.

Electrical Contractors Must Pass Examination

An ordinance requiring local electrical contractors to pass examinations before being granted licenses to operate was passed by the city commission of Tallahassee, Fla., August 30. The ordinance sets up an examining board but members have not yet been announced.

Harth Company Opens In Columbia, S. C.

Permanent quarters are now being prepared at 908 Main Street, Columbia, S. C., for the Harth Electrical Contracting Company, Inc., now open in temporary quarters at 121 South Bull Street.



In this attractive building, the J. R. Hime Electric Company utilizes the entire front as display space. Venetian blinds protect displays from morning sun. Places of business must be carefully planned to comply with building restrictions in West Palm Beach, Florida.

Utilities

Exchange Engineers Meet in Atlanta

Members of the Engineering and Operation Section of the Southeastern Electric Exchange held their first meeting of the new administrative year at the Henry Grady Hotel, Atlanta, Ga., September 28 and 29. R. I. Butterworth, general superintendent, East Tennessee Light and Power Company, presided over the meeting.

The application of series capacitors for voltage regulation on distribution lines was discussed at the Thursday morning session by C. C. Moler, distribution engineer, The Potomac Edison Company, Hagerstown, Md. J. D. Hoffman, Switchgear Division, General Electric Company, Philadelphia, also addressed this meeting, his subject being "Modern Switchgear."

Henry B. Sargent, vice-president in charge of operations, Mississippi Power and Light Company, was one of the speakers at the Thursday afternoon session. His subject was controlling operating expenses.

Switching transients and their significance in power system design was the subject of a talk and demonstration by R. L. Witzke, central station engineer, Westinghouse Electric and Manufacturing Company, Pittsburgh. Mr. Witzke presented a most interesting demonstration of transient phenomena making use of a portable miniature electrical system. The Thursday afternoon session was concluded with a demonstration of pole top resuscitation presented by the Georgia Power Company.

At the Friday morning session, L. C. Flournoy, superintendant of distribution, Alabama Power Company, Birmingham, discussed experience from operating rural systems. He was followed on the program by J. F. Pennington, superintendent of wholesale operations, Georgia Power Company, who spoke on the reclaiming of transformer and switch oil.

The principal feature of the Friday afternoon session was a round table discussion on transmission, distribution, metering, utilization, and transportation problems. A closed meeting for members only was held Friday afternoon to provide opportunity for a full discussion of apparatus and equipment troubles and failures.

Results Announced In Safety Contest

Final results in the public utilities twelfth annual safety contest for the twelve months ending June 30, 1939, have been announced by the National Safety Council, Inc., Chicago.

One hundred and sixty-three companies participated in the 1938-1939 contest representing 162,727 employees. The average disabling injury frequency rate for all companies was 8.784. Of the various divisions in the contest, combination gas and electric companies had the lowest frequency rate, averaging 7.473.

Frequency rates averaged 13 per cent lower than in the 1937-1938 competition but the largest reductions were in electric companies, averaging 21 per cent.

Thirteen companies went through the contest without a single disabling injury and of these, the Gulf Power Company, Pensacola, Fla., worked the largest number of man-hours—500,994.

A number of southern utility companies ranked high in the contest awards. Among the combination gas and electric companies, the Virginia Electric and Power Company was first in its group, having only five disabling injuries for 3,997,997 man-hours worked, representing a frequency of 1.251. Oklahoma Power and Water Company, Sand Springs, Okla., was one of three companies in group C of the combination gas and electric companies reporting no disabling injuries during the period. Gulf Power Company, Pensacola, Fla., was one of nine companies reporting no disabling injuries during the period in its electric division group.

In the gas utility division, the Dallas Gas Company, Dallas, Texas, ranked first in Group B. They reported only two disabling injuries in 1,117,721 man-hours worked. In Group C of the gas utility division the Asheville Gas Company, North Carolina, was first with no disabling injuries.

Bryan Hanks Resigns Utility Presidency

Bryan C. Hanks, president of the Florida Power & Light Company since 1937, announced his resignation from that position on September 5 as well as the formation of the law firm of Hanks & Pres-

Executives of six companies gathered for this photograph snapped at the Mid-West Service Corporation Conference in Dallas. Reading from left to right are Doug Scharf, assistant manager, Midland Lamp Division, Chicago; J. T. Nee, Dallas district manager, Edison General Electric Appliance Co., Inc.; H. G. Voigt, residential sales manager, Central Power and Light Co., Corpus Christi; A. P. Hammerstrom, lighting specialist, Westinghouse Electric and Manufacturing Co., Dallas; Van N. Marker, president, Revere Electric Co., Chicago. Seated directly in front is Ed Stryker, sales promotional department, General Electric Co., Nela Park.

Would you like to hire this boy?

He can Easily Restore Service IN THE MULTI-BREAKER EQUIPPED HOME

If you could hire a boy to stop the cost of fuse replacement expense, cut the loss of load to a minimum when service is interrupted, he would be a pretty good investment. For both of these losses mean substantial profit leaks in your residential lines.

You can't put him on your pay roll, but you can save unnecessary expense just the same. Westinghouse, by means of Nofuze Multi-Breakers, simplifies circuit protection to the point where the customer can be self-servicing. A simple movement of the handle does the job. Click . . . and it's on . . . no expense to the power company for a service call . . . and the load is back on the line instantly.

It is well worth-while to talk over Multi-Breaker protection, and the promotion of this modern convenience with your Westinghouse representative. Why not call him today? Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. J-60316

Westinghouse

Nofuze Multi-Breakers

W WESTINGHOUSE ELECTRIC

ton at Miami, Fla. With the same announcement it was said that McGregor Smith, vice president and general manager, would be elected to the presidency at the annual meeting of directors to be held later in the month.

Joining Mr. Hanks in retirement and in the newly organized law firm were: Will M. Preston, head of the company's legal department since 1936; W. L. Gray, Jr., and Shelby Gaskin, also members of the legal department. The new firm will be chief counsel for the company and engage in the general practice of law.

Formerly of the law firm of Hughes, Rounds, Schurman & Dwight of New York and in the legal department of Electric Bond and Share Co., New York, Mr. Hanks came to the Florida Power & Light Company in 1925 as head of the legal department. Two years ago he advanced to the presidency and with the announcement that he was retiring from this post, it was said he would continue as a director.

The new president, Mr. Smith, came to the company early this year from the post of president and general manager of the Louisiana Power & Light Co. Before going to Louisiana, he was engineer for the Tennessee Public Utilities Commission in Nashville. He gained prominence in Miami rapidly as company negotiator in the recent Miami rate reduction case which federal courts upheld to necessitate a refund to customers of approximately $4,000,000.

Utilities Seek Ruling on Low Power Factor Lamps

Claiming that the low power factor of uncorrected fluorescent and neon-tube lamps materially increased the cost to utilities of serving such equipment and places a burden on other customers, three leading light and power companies, which serve a majority of the cities and communities of Oklahoma, asked for a rule to correct such conditions at a hearing before the state corporation commission, September 5. The commission took the case under advisement.

Witnesses of the power companies, at the hearing, claimed that the power factor of an incandescent lamp is nearly unity or 100 per cent, while a fluorescent or other gaseous-tube lamp averages ony 50 per cent. It was pointed out by witnesses that the fluorescent lamp, while more efficient for some purposes than other forms of lighting, will draw approximately twice as much current from the line for the same reading on the kilowatt-hour meter, unless power factor corrective equipment is utilized.

It was pointed out that there is a great deal of uncorrected equipment in use but that leading lamp manufacturers have recognized the deficiency and developed equipment for correcting the power factor at least up to 90 per cent of the power factor of incandescent lighting. This can be purchased at small expense and should be attached at the customer's switch, or preferably at or near the fluorescent or other gaseous-tube lighting unit.

The rule asked for by the light and power utilities will require all consumers, who install any form of gaseous or mercury-tube lighting, after the proposed rules become effective, to install capacitors at their own expense. The rule requiring installation of capacitors would also apply to existing installations when the same are reconstructed, materially altered or moved to a new location.

Witnesses pointed out, at the hearing, that while a great deal of uncorrected fluorescent and other gaseous-tube lighting equipment has been installed in the state, most of the electrical contractors, especially in the larger cities, had been conscientious enough to increase the capacity of the wiring where it appeared that the new type of lighting would overload the previously installed wiring system.

The electric company experts also contended, at the hearing, that the excessive use of current by uncorrected gaseous tube lighting devices, which is not registered on the watt-meter, therefore not paid for by the customer, imposes a discriminatory burden on other light users who use incandescent lamps exclusively.

If the present condition were permitted to go on unchecked, the witnesses contended, electric utilities would be required to provide additional generating and distributing equipment, without additional revenue, which expense must eventually be reflected in the rates paid by all consumers.

Louisiana Executive Accepts Levee Board Appointment

Ralph P. Nolan, president of the Algiers Public Service Co., of Algeria, La., has been named a member of the Orleans Levee Board by Governor Earl K. Long of Louisiana.

A native of Algiers, Mr. Nolan has been associated with the Algiers Public Service Co. for the past 15 years, becoming its president two years ago. He is also president of the Union Iron Works.

Plant Expansions Planned for Florida

Expenditure of $3,000,000 by the Florida Power & Light Company to expand the company's production and to meet Florida's increasing demand for electricity, was announced during the last week of August by company officials.

The major division of this program to increase electric generating, transmission and distribution comprises an increase of 50 per cent in the capacity of the Lauderdale-Dania plant, located 18 miles north of Miami and the company's main generating station in its interconnected system. This work includes the installation of a new 25,000 kilowatt steam turbine generator and a plant addition to house the equipment. This additional construction was set forth as a building comparable in height to an eight-story structure.

Announcing that approximately 20 railway cars would be needed to transport the generator and equipment to Florida, engineers said approximately 300 tons of structural steel, 80 tons of reinforcing steel and 12 carloads of cement has been contracted. The work will require a crew of 150 men to complete on schedule, or an estimate of 320,000 man-days.

In an official statement, it was pointed out that the peak load of 116,400 kilowatts last winter, closely approached the company's capacity. Now consumption shows an approximate 15 per cent increase over a year ago. The peak load last winter was more than double the 1933 peak of 55,000 kilowatts.

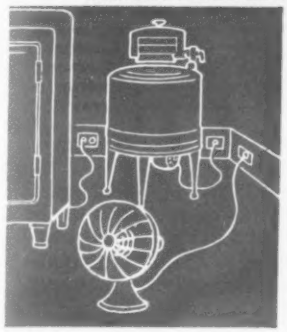
Part of this new expansion required the company to obtain authorization from the Everglades Drainage District Board for an

INVESTIGATE *the* FUSTAT

IF YOU . . .

Sell Appliances
Install Wiring
Promote ADEQUATE WIRING

The Fustat lets you use more appliances — without NEEDLESS blowing of fuses



Even on circuits that are already well loaded you can plug in washing machines, refrigerators, ironers and other motor driven appliances — because the Fustat will not blow on the motor starting current.

Yet there is no loss of protection because the Fustat will open to protect if the circuit is overloaded or there is a short-circuit.

The Fustat wipes out many useless service calls that irritate customers and often cost the dealer time and money — particularly if made during the guarantee period.

Helps sell user idea of installing new circuits

Once the proper size Fustat is installed it cannot be replaced with a substitute or with a size that is too large to protect.

If the circuit is not adequate, the user cannot dodge the issue by bridging the fuse — or overfuseing — and thus sacrificing safety.

The Fustat makes the user realize when wiring is inadequate.

Helps eliminate low voltage complaints

The Fustat keeps the user from loading the circuit beyond the proper capacity of the copper. This prevents a voltage drop that is so frequently the cause of users complaining about toasters, percolators and other appliances not operating efficiently.

Builds confidence in the electrical way of doing things

The Fustat helps sell the electrical way of doing things — for it generally permits users to add new appliances without being annoyed by needless blows . . . it assures proper operation of appliances because low-voltage cannot be caused by overloading . . . it reduces chances of users being frightened by shorted cords burning up, for the quick action of the Fustat on dangerous cord shorts — prevents spraying of metal, starting of fires, burning of users . . . it helps teach user that the protective device is a desirable safeguard instead of a nuisance . . . thus it assists the whole industry to build towards bigger business and better times.

It's just good business to sell, install and use Fustats

Retails at 7½c

WHAT IS THE FUSTAT?

It is a fuse to which a thermal cutout is added . . . It gives all the protection of a fuse . . . It protects against permanent overloads, even when as light as 25% . . . Yet it will not blow on motor starting currents . . . It has a base that guards against anyone robbing the circuit of protection . . . It fits Edison base fuseholders through the use of an inexpensive adapter that locks in place.

The FUSTAT

For Full Information write to Any of these Firms

BUSSMANN MFG. CO., University at Jefferson, St. Louis, Mo.
JEFFERSON ELECTRIC COMPANY, Bellwood, Ill.
KIRKMAN ENGINEERING CORP., 121 Sixth Ave., New York City
NATIONAL ELECTRIC PRODUCTS CORP., Fulton Bldg., Pittsburgh, Pa.
UNION INSULATING CO., 27 Park Place, New York City

Retails at 7½c
in 15 to 30 amp. sizes

electrically-controlled tide gate in the Dania cutoff canal. This was necessary to block incoming water at high tide or to hold the tide water from turbine intake pipes and allow free circulation for discharged water from the plant.

Also in the expansion program of the company is a line extension in the Northern Division area of Live Oak, Lake City, Lake Butler and Starke, an extension and rebuilding or more than 40 miles to give the area the benefit of high voltage service. Much of this new line was placed through virgin pine forests of unusual heavy density. Line extension work also was completed in the Stuart, Jensen and Sewell's Point area while notable plant repairs and new construction were completed at the Daytona Beach station.

At a recent meeting in New York, architectural, homemaking and household equipment editors of six contributing magazines reviewed and approved the newly published Home Planning Manual. Reading from left to right: George Alder, consulting engineer of Good Housekeeping Institute; Christopher Brooks, assistant editor of Good Housekeeping Institute; Julia Bourne, home economist of The American Home; Joseph B. Mason, eastern editor of the American Builder; Katharine Fisher, director of Good Housekeeping Institute; Kathleen Robertson, household equipment editor of McCall's Magazine; Grace Pennock, home equipment editor of Ladies' Home Journal; Emily Rose Burt, associate editor of Woman's Home Companion; Mary Davis Gillies, interior decorator of McCall's Magazine; Rachel Hawthorne, eastern editor of Better Homes & Gardens; Llewellyn Price, consulting architect of Woman's Home Companion; Anna Joyce Olson, news editor of Better Homes & Gardens; Elizabeth Beveridge, equipment specialist of Woman's Home Companion; W. M. Mehlhorn, architectural ditor of The American Home (standing); William Hamby, consulting architect of McCall's Magazine (seated).

Home Planning Service Operated by Utility

Monongahela West Penn Power Company is offering free home planning service featuring *Ladies' Home Journal's* adequately wired model homes. Free consultation on kitchen planning and adequate wiring, including I.E.S. lamp demonstrations, are being advertised to the public throughout the company's territory of 13,000 square miles, covering 34 counties in West Virginia, Ohio, Maryland and Virginia.

Features of the service are highlighted in displays of model homes constructed from *Ladies' Home Journal* "House Patterns," which for the past two years have been offered to readers complete with adequate wiring specifications. The displays on exhibit in the company's district offices are drawing hundreds of requests for the Small Home Year Book, F.H.A. leaflets, adequate wiring specifications, and kitchen planning booklets—all of which are offered free with building consultation service.

Home Planning Manual Announced

A new aid in the sale of adequate wiring in the form of a Home Planning Manual is announced by the National Adequate Wiring Bureau. This booklet demonstrates the new type of home planning which recognizes the increasing demand for houses designed and equipped particularly to serve today's active pattern of living.

Six leading national women's and home magazines selected six basic designs of houses which are presented in the manual and represent the most popular styles of architecture in a rising scale of sizes and building cost.

Beginning with a $5,000 small home, each house described in the manual represents a standard level of building cost and is planned for the pattern of living that such a home should serve. A two-page spread is devoted to each of the six basic houses. A final chapter employs five pages to present a completely illustrated tabulation of the national standards of minimum home wiring adequacy.

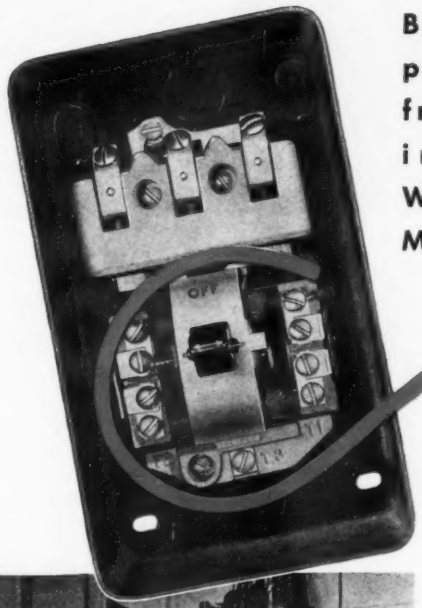
This manual will be equally useful to householders who wish to better understand and to solve their home planning and home wiring problems, to builders in their contact with prospective customers, to architects who wish to make a serious analysis of their clients' needs, and to electrical contractors who are looking for practical assistance in the task of educating their customers through a practical recognition of the need for adequate wiring.

Additional information on these booklets may be obtained by writing the National Adequate Wiring Bureau, 155 East 44th Street, New York, N. Y.

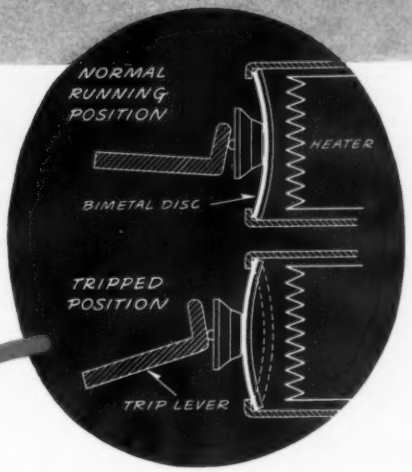
Dallas A-W Committee Obtains FHA Recognition

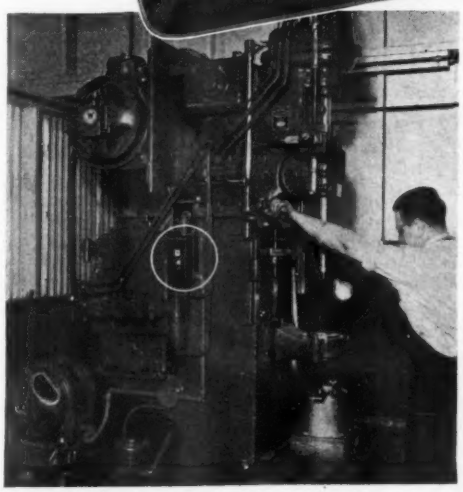
The contribution which adequate wiring makes toward enhancing the value of a home was given additional recognition when it was

lifetime calibration



Bi-metal disc protects motor from overload in this new Westinghouse MOTOR STARTER





Nothing to renew or replace

In this new manually operated motor starter, a snap action bi-metal disc protects the motor from overload. When heated by an overload current, it automatically disconnects the motor from the line before heat can damage windings. The bi-metal disc simply snaps back to normal running position — there is nothing to renew, adjust, or replace. The calibration of the bi-metal does not vary even after repeated operation.

Specify the starter with these moneysaving features

- "De-ion" Arc Quenchers prevent flashovers — prolong contact life.
- Indicating handle shows clearly whether starter is On, Off or Tripped.
- Safety interlock prevents accidental contact with live parts.

The Westinghouse "De-ion" Motor Watchman is available for motors up to 7½ hp. Your nearest Westinghouse distributor stocks them, or you may get complete data from any Westinghouse office or industrial agent.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO., East Pittsburgh, Pa.

J-20850

Westinghouse

"De-ion" Motor Watchman

W WESTINGHOUSE ELECTRIC

announced recently that certificates of wiring adequacy issued by the Dallas Adequate Wiring Committee will be accepted by the Dallas office of the Federal Housing Administration as evidence of better construction.

The F.H.A. will recognize these certificates in making appraisals and in deciding on the size of the loans that should be made. The plan for giving this recognition was worked out by the Committee and Arch C. Baker, chief architect for the F.H.A. in the Northeast Texas District. Stanley Zercher is chairman and P. M. Rutherford, Jr., is secretary-treasurer of the Committee.

The electrical specifications must contain a statement such as the following if the credit is granted:

"The wiring system embodied in these specifications has been planned to conform with the standards of adequacy of the National Specification for Residential Wiring. This contractor shall apply for and upon completion of the work obtain from the Dallas Adequate Wiring Committee, certification that the wiring in this dwelling complies with the specifications approved by the National Adequate Wiring Bureau."

D. W. Atwater, president of the Illuminating Engineering Society, at the left, is shown here congratulating L. G. Graves, right, on his election to the presidency of the society while O. R. Doerr, chairman of the I.E.S. convention executive committee, looks on. The election took place at the five-day annual convention in San Francisco. Mr. Atwater is manager of commercial engineering for Westinghouse Lamp Division at Bloomfield, N. J. Mr. Graves is vice president of Curtis Lighting, Inc.

Associations

Wholesalers Convention Scheduled for Cincinnati

The semi-annual convention of the National Electrical Wholesalers Association will be held at the Hotel Gibson, Cincinnati, Ohio, October 16 to 20, 1939, according to announcement by E. Donald Tolles, managing director.

Dallas Electric Club Resumes Meetings

On Monday, September 11, the Dallas Electric Club of Dallas, Texas, resumed its regular luncheon meetings for the fall season. With the exception of the three summer months, the club meets each Monday at the Baker Hotel for luncheon and a short business session.

The opening meeting was addressed by A. F. Dickerson, manager of the Illuminating Laboratories of the General Electric Company at Schenectady. His talk was on the lighting of the Golden Gate Exposition at San Francisco and was illustrated with a number of colored slides. Mr. Dickerson is a native of Texas, a graduate of Texas A. & M. College, and one of the nation's outstanding authorities on outdoor illumination.

Members of the Dallas Technical Club and the Dallas Chapter of the Illuminating Engineering Society were guests of the Electric Club on the occasion of the opening fall meeting.

Wholesalers

Charlotte Distributor Adds New Line

The Southern Bearings & Parts Company, distributing organization covering North and South Carolina with headquarters in Charlotte, will distribute the new Farnsworth line of radios and phonograph combinations, according to announcement by John Northey, president. The company has just concluded a two-day session in Charlotte which gave dealers an opportunity to view the new line.

District showings of this new appliance line will be held throughout North and South Carolina during the next two weeks when a number of new dealers will be appointed, according to George Fulenwider, general merchandising manager.

C. E. Beeson, secretary and treasurer of the company, after tabulating orders placed by dealers, stated the results were very gratifying, proving to his organization that Farnsworth, the oldest name in television and the newest name in radio, has dealer acceptance.

Mr. Fulenwider stated that many dealers advised, that in preparing for television in the future they would start now to advertise their store as Farnsworth headquarters, to not only cash in on the present line of radios and phonographs offered this year, but to have the consuming trade come to their stores to purchase Farnsworth Television receivers when television becomes an actuality in their communities.

Southern Bearings & Parts Company had been out of radio business over a year. However, they have kept their dealer contacts as they have distributed Norge products in North and South Carolina for several years.

Distributor Sponsors New Testing Device

The Anderson Hygrometer, something new in a moisture tester, has been introduced to the cotton gins and cottonseed oil mills by the Riechman-Crosby Company, of Memphis, who will manufacture the instrument. N. C. Anderson, who calls on the cotton gin trade for the Memphis firm, is the inventor.

The instrument is used to make a moisture test in 90 seconds, to enable the mills to know whether moisture condition of the seed is such that it can be stored as it comes in, thereby insuring them against hot seed, which could be a great loss to a mill.

N. C. Anderson, inventor of the moisture tester, is shown here demonstrating its operation

The hygrometer consists of a dry and wet bulb thermometer mounted in an all-aluminum body, and comes equipped with an 18" and 36" lance. A self-computing copyrighted chart, easy to read and requiring no technical knowledge, is supplied with the equipment. A special vacuum motor for a-c or d-c supply with an extension cord, and a glass bottle for water with wick attached to the wet thermometer completes this simple apparatus. It can be attached to a lamp socket, and weighs only 8 pounds.

Walther Employees on Vacation

Walther Bros., Inc., electrical appliance distributors, adopted the "closed store" vacation plan this summer. All employees of both the New Orleans and Montgomery offices received a week's vacation with pay beginning August 14, during which time both stores were closed.

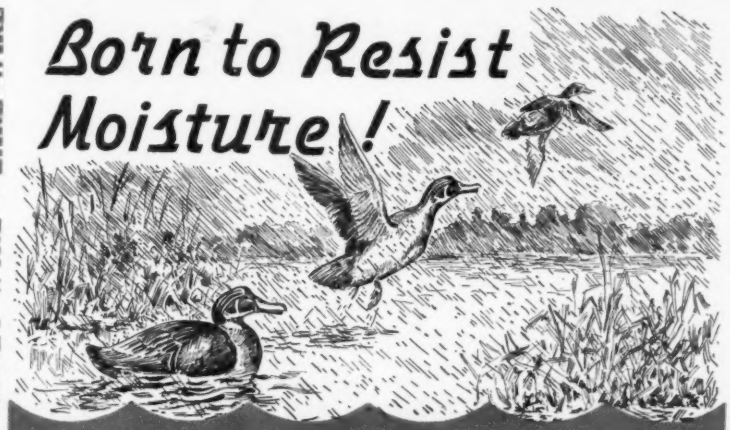
New Orleans Jobber Plans Expansion

Dixie Electric and Auto Parts Company, 901 Carondelet St., New Orleans, has purchased a group of buildings at Carondelet and Julia Sts. for expansion and will move when its present lease expires on October 1.

The property has a frontage of 44 feet on Carondelet St. and 130 feet on Julia Street. Part of the buildings will be remodeled and the corner structure will be rebuilt after January 1, according to Harry Ginsburg, president.

RUBBER COVERED POWER CABLES • BUILDING WIRE
CRESFLEX NON-METALLIC SHEATHED CABLE • SERVICE ENTRANCE CABLE • MAGNET WIRE • BARE WIRE
VARNISHED CAMBRIC • FLEXIBLE CORDS • LEAD-ENCASED AND PARKWAY CABLES • ARMORED CABLE

Born to Resist Moisture!



CRESCENT IMPERVEX

INSULATED WIRE and CABLE

Here is a special moisture resistant insulating compound used on building wires and secondary network cables without lead sheath in moist locations. CRESCENT IMPERVEX is not only highly resistant to water absorption, but it is also superior in its resistance to the effects of ground acids and alkalis. . . . And one thing to remember, IMPERVEX IS MADE ONLY BY CRESCENT.

CRESCENT INSULATED WIRE & CABLE CO. INC
TRENTON, NEW JERSEY

SOUTHERN REPRESENTATIVES
ATLANTA, GA.
Edgar E. Dawes
A-4 Rhodes Bldg. Annex

NEW ORLEANS, LA.
Paul Hogan, Jr.
823 Perdido St.

CRESCENT ENDURITE SUPER • AGING INSULATION

MANUFACTURERS' News

Premier Opens Fall Campaign

The entire fall advertising and merchandising campaign for Premier vacuum cleaners was outlined to all of the company's mid-western sales division managers at a meeting in Chicago on August the 14th and 15th. Reprints of all the advertisements Premier will use in national magazines between now and Christmas were on display for the first time, and the assembled managers also received an introduction to the unique floor display which will play such a big part in Premier's sales efforts this year.

All of Premier's national advertising—which opens with a four-color page in the Saturday Evening Post—is concentrated on the new Premier "Partners." These "Partners" are a combination of the Premier Vac-Kit and the Premier Floor Cleaner. The copy theme of the campaign stresses the ease with which these two specialized vacuum cleaners clean each of the two dirt zones in every home—the above-the-floor dirt zone and the on-the-floor dirt zone—thus putting an end to "half-way housecleaning."

Premier's unique floor display attracted special attention. All who saw it were in agreement that the display did everything but talk. It displays the actual merchandise, shows pictures of it in use, and the large illustrated booklet which is an integral part of the display tells how the merchandise is made and why it performs as it does.

The rest of the fall campaign as outlined at the meeting includes advertising in home economics publications, intensive campaign in electrical dealer publications, dealer broadsides, window displays, consumer broadsides and educational booklets.

Those who attended the Chicago meeting, in addition to all mid-western sales division managers, were R. B. Wilson, executive vice president; John B. Buckley, comptroller; H. U. Mann, wholesale sales manager; E. A. Hamala, advertising manager, as well as F. T. McDonough of Beaumont & Hohman, Inc., Premier's advertising agency.

R. B. Wilson and H. U. Mann, of Premier Division, Electric Vacuum Cleaner Co., Inc., and F. T. McDonough, of Beaumont & Hohman, Inc., advertising agency, inspect Premier's fall advertising at recent Chicago meeting.

General Electric Launches Full-Line Program

Heralded by the slogan "It's Easy To Stay Young Electrically," the General Electric Company will launch in October the most ambitious and complete nation-wide advertising program in behalf of its full line of home appliances that has ever been contemplated in the company's history, it has been announced by C. H. Lang, general advertising manager.

Full-color insertions in national magazines having a total circulation of 44,992,000, during the last three months of 1939, will form the spearhead of the drive, backed up by a complete merchandising program involving distributors, retail dealers, department stores, and electric service companies.

Most important feature of the campaign in the estimation of G-E officials is that barring unforeseen developments it will be a consistent and continuous effort, establishing a broad base from which individual product advertising will derive added support. "It's Easy To Stay Young Electrically" copy will supplement the regular campaigns now carried on for specific appliances.

In general, according to Mr. Lang, the new program is three-dimensional in nature. It will consistently explore the story of electric appliances as personal services which save labor and thereby preserve youth and aid physical well-being; it will feature in all the copy the complete line of G-E devices for the home, including refrigerators, ranges, water heaters, cabinets, electric sinks, dishwashers, disposalls, home laundry equipment, clocks, cleaners, fans, table cooking appliances, health lamps, radio, and the electric blanket, on the theory that one product helps to promote another and that all in combination represent electrical living; and, third, it will periodically headline a special merchandising "deal" on a specific product, enabling dealers to benefit directly from the national magazine advertising.

Emphasis in all copy will be on the personal services which electricity provides, rather than on price and engineering features. Basis for the campaign was developed through consumer surveys carried on in typical towns and cities several months ago, after which it was decided that the theme should capitalize on the basic instinct in women to stay young and beautiful—and to spend a large share of the collective national income in obtaining that end.

Westinghouse Expands Laundry Retail Training

Based on a "salesmen are not 'born,' they're trained" theme, Westinghouse is planning the most comprehensive laundry equipment promotional and retail sales training program for 1940 it has ever had. This expansion of the current retail sales training and general promotion program started simultaneously with the announcement of the 1940 washer and ironer models about September first, according to L. L. Shawber, manager of the Laundry Equipment Department.

Emphasis for the retailing training program will be placed on securing a 100 per cent membership among laundry equipment retail salesmen for the "Minute Men," national honorary sales organization. Organized

late in the Spring of 1938 this sales organization has more than 1,800 members.

Membership in this honorary organization is attained by salesmen successfully passing a training course in which their knowledge, not only of the product, sales and advertising plans is tested but by being able to use the washer and ironer to launder clothes for demonstrations.

Members of the "Minute Men" must know the correct way to actually complete a washing and ironing. After the salesmen have been thoroughly drilled in the correct way to wash and iron clothes they are given a schooling on the product, its care and use.

Minute Men members are given certificates testifying to their ability to wash and iron clothes. In addition to a certificate each man gets a Minute Man pin.

Meetings will be held in the field to initiate new classes of Minute Men at the same time the 1940 laundry equipment line is introduced. Complete sales and advertising plans will also be revealed at these announcement meetings.

News About People

Boyd W. Bullock, for the past 17 years associated with the publicity department of General Electric Company at Schenectady, has been appointed advertising manager of the company's appliance and merchandising department at Bridgeport, Conn., according to announcement by **H. L. Andrews,** vice-president in charge of appliance activities. Since 1933, Mr. Bullock has been assistant manager of the publicity department, closely associated with apparatus and institutional advertising and broadcasting.

Mr. Bullock has been associated with General Electric publicity, broadcasting, and advertising activities since 1922. Up to the present, however, he has been concerned primarily with industrial and institutional promotion.

Boyd W. Bullock

* * *

Election of **Avery C. Adams** as vice-president in charge of sales and a member of the executive committee and board of directors, United States Steel Corporation of Delaware, has been announced to become effective October 1. Mr. Adams succeeds **C. V. McKaig,** who becomes assistant to president. Mr. McKaig continues as a member of the executive committee and board of directors.

Mr. Adams has spent his entire business career in the steel industry. He first joined United States Steel subsidiaries in 1936. Since December 1, 1938, he has been vice-president and assistant general manager of sales for Inland Steel Company.

* * *

C. H. Guy, for three years merchandising manager of the Westinghouse Electric & Manufacturing Co. in the south central district, has been transferred to Chicago, where he succeeds **C. A. Dostal** as merchandising manager of the northwestern district. The southeastern and south central districts of the company will be consolidated under the management of **S. M. Davison,** with headquarters in Atlanta, Ga.

* * *

Appointment of **P. M. Bratten** as head of all activities in the household sales division, effective immediately, has been announced by **E. G. Biechler,** general manager of Frigidaire Division of General Motors Sales Corporation. Prior to his new appointment, Mr. Bratten has been manager of the company's Fort Worth sales district for several years.

Above you see a close-up of two beauties, Joan Bennett and Cory Royal, as they appear in the new film, "The Housekeeper's Daughter." It's a Hal Roach—United Artists picture based on a best selling novel by Donald Henderson Clark. Featured players in addition to Miss Bennett, are Adolph Menjou, Peggy Wood, William Gargan and others. Because of the fact that coffee is an essential clue in this comedy mystery, the Cory Coffee Brewer plays a prominent part, and shows to great advantage.

P. M. Bratten

* * *

A. E. Newman, manager of wiring material sales for the General Electric Company, was recently appointed to membership in the Underwriters' Laboratories' Industry Advisory

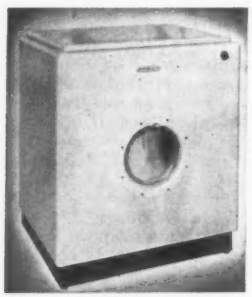
A display designed by Joseph H. Reich, of Joske Brothers Company, San Antonio, Texas, was awarded the first prize of $250 in the recent Easy-Oxydol window display contest conducted among Easy washer dealers.

Conference for rubber-covered wires and cables. Mr. Newman succeeds W. E. Sprackling of the Anaconda Wire & Cable Company, who has served on the conference for several years.

The Advisory Council provides the laboratories with contacts among industry representatives. It enables both the laboratories and industry to consult on problems which arise in connection with the testing, factory inspection and labeling of products.

G-E Tumbler Clothes Dryer

A new tumbler clothes dryer, designed to make the home laundry process completely automatic and eliminate much of the time and labor involved in outside drying, has been introduced by the General Electric home laundry equipment section of Bridgeport, Conn. The dryer utilizes electric heat and clothes



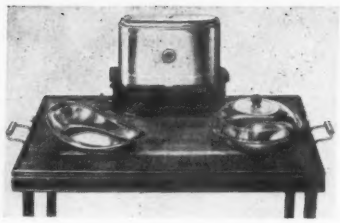
placed in it are tumbled slowly about through pools of clean, warm air by the action of a revolving cylinder.

In the new tumbler, clothes can be damp dried ready for ironing in approximately 15 minutes, and such articles as towels which do not require ironing can be completely dried in from 30 to 45 minutes. The capacity of the drying cylinder is seven pounds of dry clothes. The cabinet is designed to blend with modern kitchen or basement appliances. It is finished in two coats of white baked enamel and measures 38-3/4 inches high, 33-1/2 inches wide and 27 inches deep. The device consumes 4600 watts per hour and is rated at 220 volts, 21½ amperes.

Toast-O-Lator Tray-Table Set

The Crocker-Wheeler Electric Manufacturing Company, Inc., of Ampere N. J., announces the introduction of their latest addition to the electrical appliance line, a Toast-O-Lator complete with a tray-table ensemble which consists of the Toast-O-Lator, an inlaid folding tray-table, a solid brass chromium-plated bread tray, and a solid brass chromium-plated covered toast bowl. Several special deals have been planned to introduce this appliance to dealers.

The outstanding feature of the Toast-O-Lator is its completely automatic action. Bread goes in one end and toast comes out the other. One



simple control provides for lighter or darker toast and also compensates for fluctuations in the house voltage. The bread is in constant motion up and down also which gives it an even brown without grid marks.

New Hotpoint Ranges

Two new ranges have been added to the Hotpoint line by Edison General Electric Appliance Co., Inc., Chicago, designated as the Exposition and the World's Fair models. The World's Fair model, illustrated here, is 39 inches wide, finished completely in porcelain enamel with acid-resistant finish on the cooking top. Snap-on type switch buttons and

streamlined door and drawer handles are of black molded Textolite. The cabinet base includes one spacious utility drawer. Two utility and one Giant size Hi-Speed Select-A-Heat (5 Heat) Calrod units and a big six-quart thrift cooker are provided for surface cooking. Two units provide five different heats in the oversized directional heat oven.

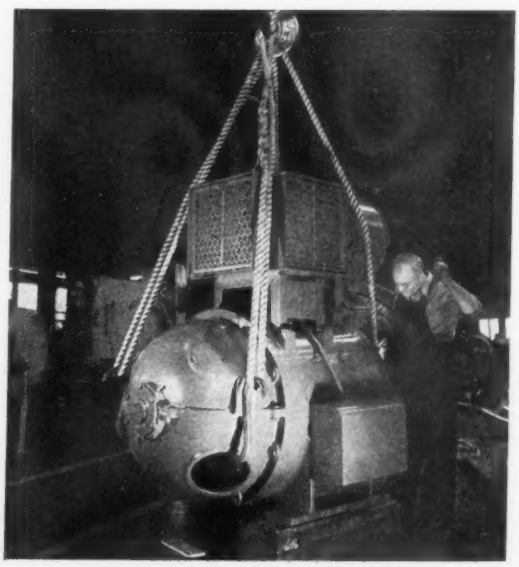
The Exposition range is a full capacity model 36 inches wide designed for the small, modern kitchen.

Armstrong Master Ironer

The Armstrong Products Corporation of Huntington, W. Va., announces a new master ironer, streamlined in design, and equipped with a full 21-inch free roll. Built

to retail at only $34.50, the new ironer fits the great mass market. It is equipped with automatic thermostatic control and red safety light. Operation is simple with convenient elbow control which allows freedom of both hands.

A continuous self-demonstrating



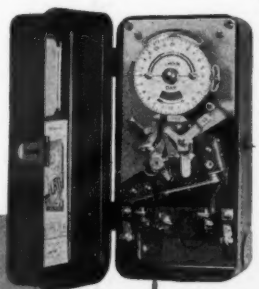
Everyone's familiar with glass-insulated thermos bottles but few people have ever heard of a glass-insulated motor. Here is one just built by the Allis-Chalmers Mfg. Co. that has all its coils insulated with woven glass tape. Ordinary insulating tape would char under the temperature at which this motor is designed to operate, so woven glass insulating tape is used. The motor is equipped with its own ventilating system consisting of a filter, motor and blower which forces cool, pure air to its windings. The motor shown here is rated at 250 hp, 400 rpm, 230 volts, d-c.

STREET LIGHTING CONTROL

MODERN *with* SANGAMO ASTRONOMIC DIAL TIME-SWITCHES

Sangamo Astronomic Dial Time-Switches fulfill the exacting requirements for modern street lighting control. Three types of driving movements meet a wide range of service conditions. Two of these are for use on controlled frequency circuits: the straight synchronous motor drive, and the latest development, the synchronous motor drive with electrically wound carryover, which provides for operation of the switch during ordinary service interruptions. The third is the electrically wound movement with 20-hour carryover and full-jeweled escapement for either alternating or direct current service. Furnished for indoor or outdoor mounting, or, in certain types in the socket construction, Sangamo Astronomic Dial Time-Switches are available for any conceivable public lighting control application.

The ten-hour carryover feature of this Form VSWZ Astronomic Dial Time-Switch functions automatically during current interruptions. Normally, no re-setting is required the year around.



Automatic convenience at economical first-cost is provided by this Sangamo Form KAZ Astronomic Dial Time-Switch.

Model F, Form VSFZ Astronomic Dial Time-Switch in standard socket construction. Time can be set through opening in cover.

SANGAMO ELECTRIC COMPANY SPRINGFIELD ILLINOIS

store display has been developed for continuous demonstrations of the Armstrong Porta-Lectric ironer as well as the new master ironer recently announced. This demonstrator is a full-sized model holding a roller towel which runs from the model's hands around the ironer roll continually. A continuous advertising message is printed on the towel.

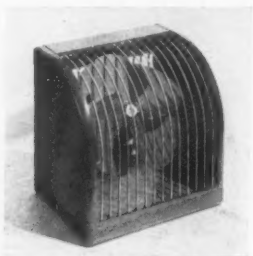
New Sunbeam Mixmaster

A new Sunbeam Mixmaster featuring an automatic Mix-Finder, has been announced by Chicago Flexible Shaft Company, Chicago, Ill. With the new automatic Mix-Finder, the user simply dials the correct

mixing speed for any job at hand. Correct speeds for different uses are plainly indicated on the dial and whether it's creaming the butter and sugar for a cake, blending salad dressing, or whipping mashed potatoes the housewife is assured of correct speed and proper operation through this new device.

Westinghouse Floor Fan

A new fan called Floor-Aire, primarily designed for floor or low placement, has just been announced by the Westinghouse Electric & Manufacturing Company, Mansfield, Ohio. This new fan is housed and



completely protected in a walnut finish grilled cabinet and may be placed anywhere on the floor without inconvenience to occupants of the room.

The grills are vertical steel wires, finished in antique bronze. Felt feet protect floors and deep-pitched ultra-quiet Micarta blades insure maximum air circulation with a minimum of sound.

Universal Appliance Catalog

Landers, Frary & Clark, New Britain, Conn., have just announced a new electric appliance catalog showing many new items in their Universal line. Featured in the new catalog is the Devonshire line of matched appliances. The charming motive of this pattern is taken from the Adam design which was so popular during the early eighteenth century. Available in the Devonshire pattern are toasters, waffle irons, griddles, percolators, as well as complete percolator and coffee urn sets.

Fluorescent Lighting Folder

A new small size folder on Wiremold fluorescent lighting systems has just been published by The Wiremold Company, Hartford, Conn. The new folder not only describes the flexible Wiremold method of installing the new fluorescent lamp but also shows typical applications and photographs of particularly interesting recent installations. Copies are available for distribution on request.

New Fluorescent Luminaires

Designed for general or supplementary industrial lighting applications, a new flourescent lighting unit has been developed by the Westinghouse Electric & Manufacturing Company. Both single and two-lamp units are available for either 120 or 240-volt supply. A steel housing completely encloses reflectors, sockets and controls, making a durable rugged unit. All housings are finished outside with silver gray hammerloid surfacing and inside with baked white synthetic enamel.

The reflectors are finished by the Alzak process to assure permanent, high efficiency and easy cleaning. All housings except on the 24-inch units are provided with two-point suspension for attaching to ½ or ¾ inch conduit. Swivels are used where it is necessary to tilt fixtures. Additional information may be obtained from the lighting division, Westinghouse Electric & Manufacturing Co., Cleveland, Ohio.

Hubbell Wiring Devices

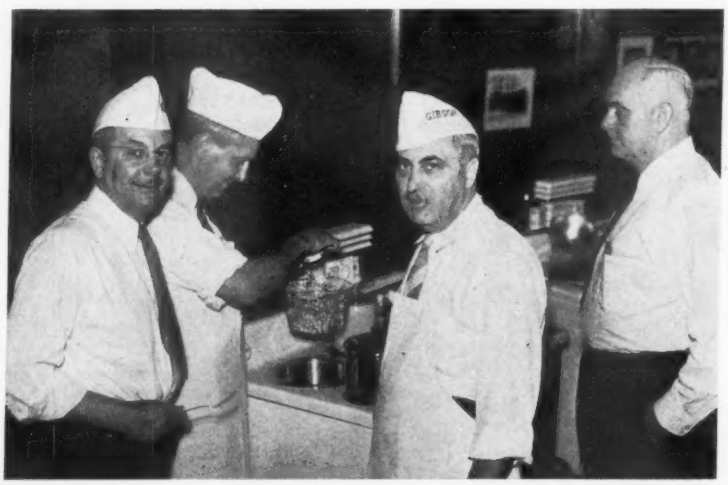
Catalog No. 24 describing a wide range of rugged wiring devices is announced by Harvey Hubbell, Inc., Brideport, Conn. The catalog has been specially arranged to facilitate reference to various types of devices.

Textolite Lampholder

A further extension of the use of Textolite instead of porcelain in certain items of the G-E wiring device line has been announced by the General Electric appliance and merchandise department, Bridgeport, Conn., with the introduction of four new enclosed fuse cutouts and a new lampholder for sign work.

The Textolite cutouts supercede four porcelain cutouts in the present line. All are black in color but the new cutouts are lighter in weight and have a higher resistance to breakage. They also provide better alignment of contacts.

A new one-piece Textolite lampholder for sign work replaces a porcelain lampholder of similar catalog number. It is designed for use in metal signs and has binding screw terminals.



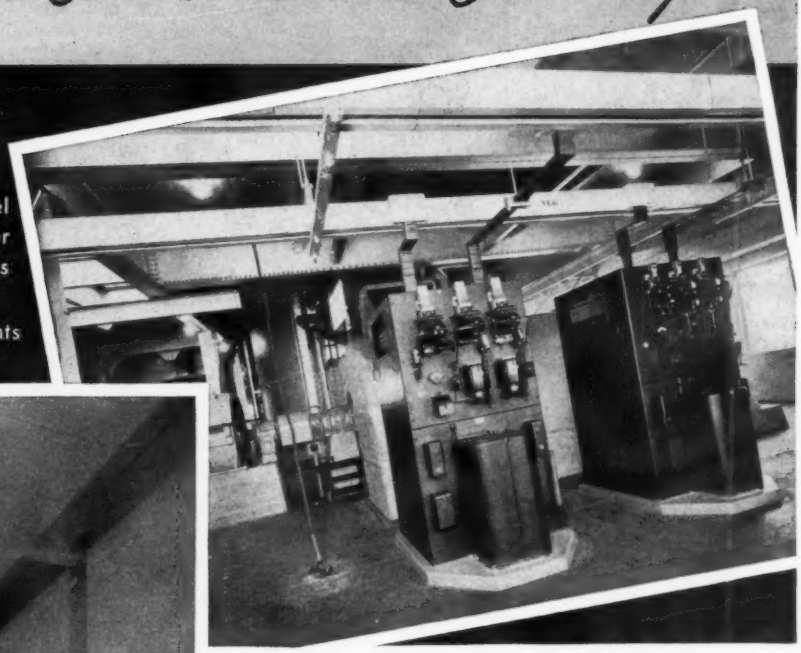
Eight divisional sales managers of Gibson Electric Refrigerator Corporation, Greenville, Michigan, inaugurated a new kind of product education in a recent four-day factory session by taking part in an intensive product practice school. In their study of the new Gibson electric range, the Gibson men went all the way, starting with an examination of the wires in the oven elements and finishing by cooking a complete meal in the Gibson Kookall Kettle. In the photograph above, C. J. Gibson, president of this firm, looks on while F. E. Basler, general sales manager, and Bower Murphy and Ed Jacobs, division sales managers, stage an actual demonstration.

WHAT A COMBINATION OF DESIRABLE PROPERTIES!

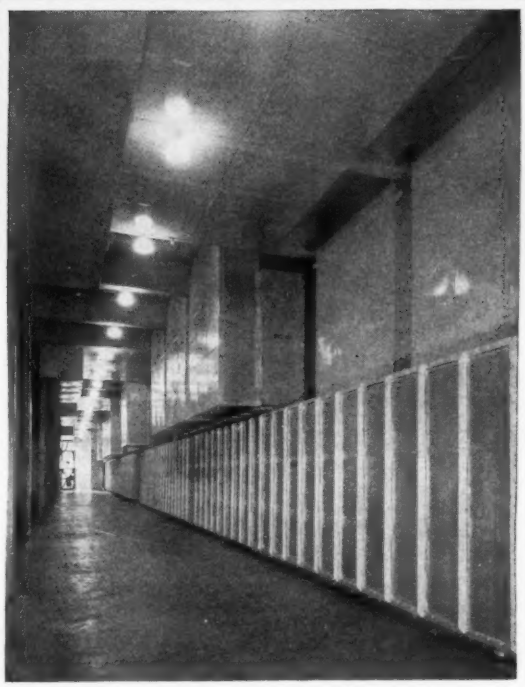
Aluminum Bus Bars and Housings

ALCOA

Alcoa Aluminum Channel Bus Bars Supply Power to Station Auxiliaries



These Aluminum Compartments House 24,000-volt Buses



Ask our engineers for assistance on your bus bar and enclosure problems. ALUMINUM COMPANY OF AMERICA, 2164 Gulf Bldg., Pittsburgh, Pa.

The Detroit Edison Company employs Aluminum enclosures for the high current buses and switching apparatus at Essex Switching Station and the Conners Creek plant. Because it is non-magnetic, Aluminum avoids the heating effect of magnetic materials under similar conditions. Equipment housed in Aluminum carries heavier loads without overheating.

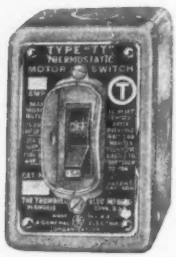
Some bus bars at these stations are likewise Alcoa Aluminum. They provide high electrical conductivity, are light in weight and highly resistant to corrosion.

Aluminum housings and bus bars are easily fabricated from standard structural materials, purchased from stock. Aluminum construction is strong and neat, and needs no protective coating of paint. Its lighter weight places less burden on supporting structures, thereby simplifying construction and reducing costs.

ALCOA · ALUMINUM

Type "TT" Manual Starters

The Trumbull Electric Manufacturing Co., Plainville, Conn., recently announced the new type "TT" thermostatic starter, a new design of auxiliary breaker to provide control and overload protection for a-c or d-c motors of 1 hp or less, through thermostatic action.



The manual starter is manufactured in both single and double pole and provides quick make and quick break of its contacts which are silvered to insure long life. Complete operation and construction description is given in circular No. 317 which is available to the trade upon request.

Nofuze Load Centers

A new catalog has just been issued by Bryant Electric Company, Bridgeport, Conn., describing the Bryant line of Nofuze multi-breaker load centers. In addition to complete specifications on type M, MB, and MBM multi-breakers, this catalog contains information on Nofuze types and applications, how to select a load center, box dimensions and hubs, box knockouts, table of minimum wire sizes, and information on the use of multi-breakers with sub-feeders. Copies of the catalog are available to the trade upon request.

Adjustable Angle Adapter

A new adjustable angle adapter designed for use with projector and reflector lamps is now offered by The Arrow-Hart & Hegeman Electric Company, Hartford, Conn. The lower half of this unit rotates 340 degrees. The flexible joint allows vertical adjustment up to 70 degrees from perpendicular, thus permitting a wide range of lamp direction. A handy set screw is provided to permanently hold the flexible joint in the desired position.

Stoker Motor Protection

Making possible stoker drives self-protected against any operating condition except fire and flood, the new Thermoguard stoker motors are announced by the Westinghouse Electric & Manufacturing Company. The Thermoguard feature takes the motor off the line before it can be damaged by continuous overload, frequently repeated overloads, clogging of stoker feed, inability to start because of low voltage, inability to run because of low voltage, excessive temperatures, or failure of ventilation. As soon as it is safe, the Thermoguard puts the motor back on the line.

Starting switches are said to be exceptionally trouble-free with arcing reduced through extremely fast make-and-break action. Silver contacts prevent sticking or corrosion.

Weatherproof Switch

The advantage of outdoor weatherproof switch control and flush receptacles are combined in a new two-gang unit announced by The Arrow-Hart & Hegeman Electric Company, Hartford, Conn. It is complete with switch, receptacle, cadmium finished brass plate and rubber mat. There is a choice of single pole, double pole, three or four way switch. The receptacle is Bakelite with a T slot and convenient finding grooves. When the receptacle is not in use, the metal cap screws over the opening thus protecting it from rain or hose cleaning.

Buffalo Duct Fan

For those installations where it is desirable to use a propeller type fan, but where the motor must be outside the air stream, the Buffalo Forge Company, Buffalo, N. Y., announces the Buffalo "L" Breezo fan.

The motor, V-belt, pulleys and one bearing are entirely outside the path of air being handled. The bearing at the fan end of the shaft which is in the air chamber is regularly of bronze, enclosed and wool-packed, requiring oiling only about once every 2000 hours of use. The fan housings are so designed that air inlet may be at top, bottom or either side of the unit and may be changed from one to another on the job if necessary. A new bulletin, No. 3186, describes the new line in detail.

Multi-Range Clip-On Ammeter

A new multi-range clip-on ammeter reading from 0 to 1000 amperes and having five full scales of 0-10/25/100/250/1000 amperes has been announced by Ferranti Electric, Inc., New York, N. Y. Only one simple set of scale divisions are provided and all full scales are multiples of 10 or 25.

The meter is well balanced, easy to operate and has clamping jaws which are well insulated. The meter has a 2 1/4" rectangular opening which makes it adaptable for use on square busbars as well as round cables.

Capacitor Motor Booklet

Describing capacitor motors of 1/20 to ¾ hp for unit heater, fan and blower applications, a new booklet is announced by the Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa. The booklet shows cutaway drawings, outline dimensions, and typical installations of the units.

These motors provide single speed operation with the ordinary on and off switch but high and low speed operation is available with an inexpensive two-speed switch, and multi-speed operation with a speed controller. They may be used on either 110 or 220 volt supply.

Adjustable Speed Drive

An all-electric, a-c adjustable speed drive which employs a principle of speed control heretofore confined to large units has been developed by The Reliance Electric & Engineering Company of Cleveland, Ohio. The new drive consists of a control unit and an adjustable speed motor which is applied directly to the machine to be driven. This speed-changing combination is intended to bring to motor users having only an alternating current supply an economical means of varying the operating speeds of their small motors from one hp up, over as much as a 12 to 1 range.

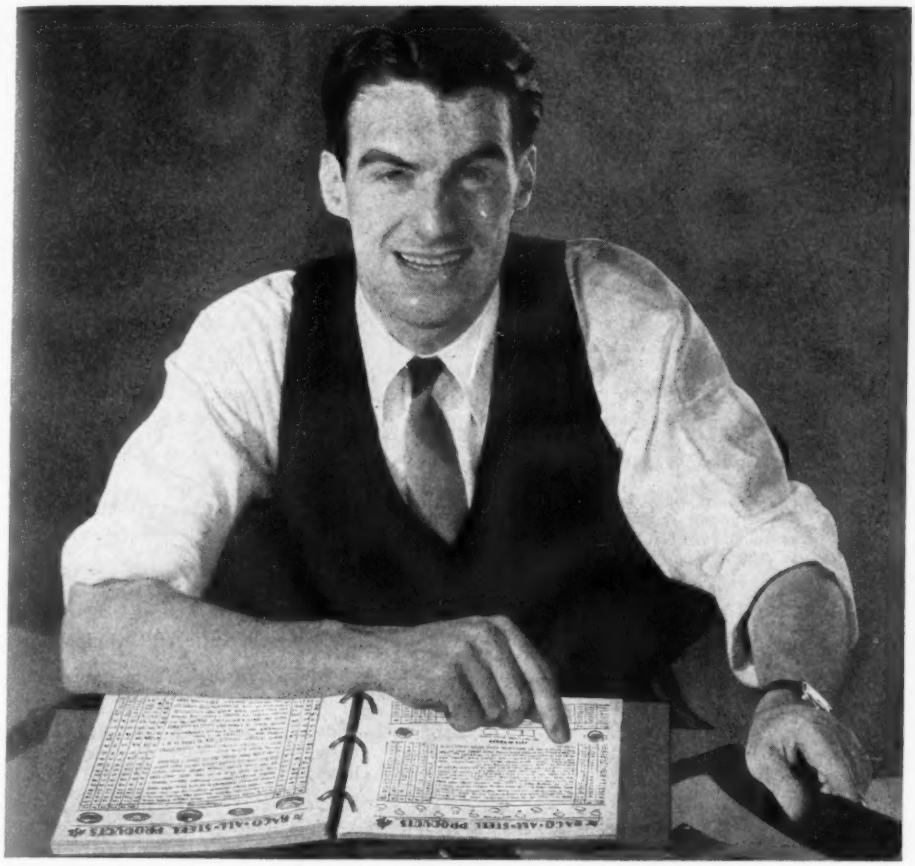
The Reliance V-S drive, as it will be known, is to be produced in quantity for off-the-shelf delivery. It is composed of elements already common to the ordinary squirrel-cage motor and d-c generator. Three wires from the power source are connected to the control unit and secondary circuits are extended from the control to the motor, speed adjuster and start and stop button. Both the speed adjuster, which is no larger than a pie plate, and the buttons for starting and stopping the motor, can be located within arm's length of the machine's operator.

"Slo-Blo" Fuses

The "Slo-Blo" line of fuses, manufactured by Littlefuse, Inc., Chicago, Ill., have been designed to carry harmless inductive or capacitative surges and overloads for a reasonable period of time but to blow before the danger point is reached.

The fuses include three essential parts, a fuse link, a resistor element, and a spring. On severe overloads, the fuse link melts as in the conventional fuse. On prolonged overloads, however, the resistor heats up and if the overload is sustained sufficiently the fusible alloy connecting the resistor to the fuse link will melt and open the circuit.

"Slo-Blo" fuses are available in the small 3AG size 1 1/4" long by 1/4" in diameter. There are nine ratings offered in the range between 1 ampere and 1/100 ampere.



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●Customer satisfaction is all-important on wiring jobs. It is assured when you use RACO●ALL-STEEL●PRODUCTS. They have won the nation-wide approval of architects, contractors, electricians and builders. This acceptance can be traced to the efficiency of these products in meeting modern wiring requirements economically.

Developed by competent engineers, RACO●ALL-STEEL●PRODUCTS keep pace with the changes in wiring trends—and present many advantages in the steadily increasing rural and urban modernization market as well as on new jobs. RACO●ALL-STEEL●PRODUCTS are designed to comply with your local conditions and requirements—and are built to facilitate installation and protect your interests.

More than 40 years of experience is behind the switch boxes, outlet boxes, cut-out boxes, cabinets, fuse cabs and conduit fittings carrying the famous RACO and ALL-STEEL trade-marks, assuring continued satisfaction and dependability. Write for a copy of the RACO●ALL-STEEL● PRODUCTS catalog—there is no obligation.

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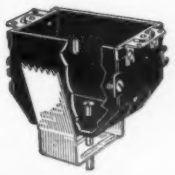
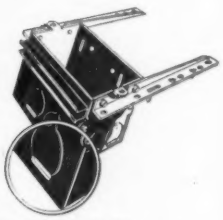
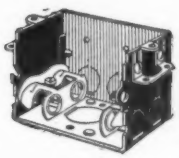
HERE ARE A FEW OF THE PRODUCTS IN THE COMPLETE RACO • ALL-STEEL • PRODUCTS LINE:



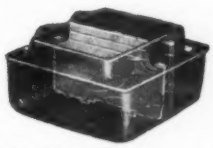
RACO●ALL-STEEL OLD WORK SWITCH BOX—for mounting in a rewiring or modernization job.



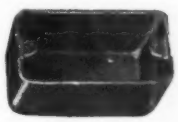
RACO●ALL-STEEL "PRI-OUTS"—for Clamp Boxes, in both the Switch Box and Outlet Box lines.



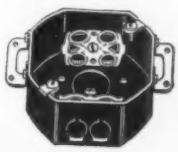
RACO●ALL-STEEL SWITCH BOXES—The MC, used in old or new work. The Switch Box you need is in the Raco●All-Steel Line.



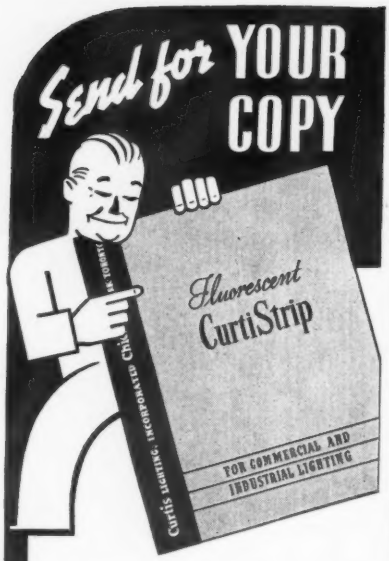
RACO●ALL-STEEL "HI-LO" BARRIERS—for the separation of differing voltages.



RACO●ALL-STEEL Utility or Handy Boxes—for surface wiring—old or new work.



RACO●ALL-STEEL External Mounting Ears—for Outlet Boxes. Any type of Raco●All-Steel Octagon Box will be furnished with External Mounting Ears on special order.



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Regarding Lighting Equipment
FOR EVERY FLUORESCENT NEED

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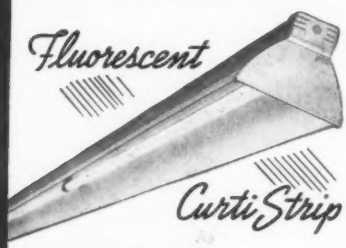

Fluorescent Curtistrip is "finished" . . . accurately engineered . . . correctly designed for easy, profitable wiring. You will find in this Curtis line the right Fluorescent equipment for both commercial and industrial installations.

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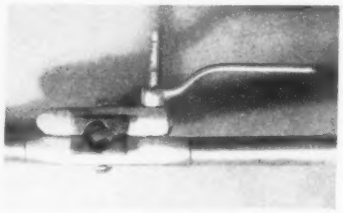
Spiral Twister Dies

A new type of sleeve twister die formed to fit the natural contour of the splicing sleeve when twisting is now available from A. B. Chance Company of Centralia, Mo. The use of this twister permits the sleeve to twist in the die to form a natural



spiral. It is said that the result is a stronger and more durable splice than is possible with the old type straight die because cutting and distortion of the sleeve is eliminated and unnatural bending of the cable is prevented. Chance spiral dies are made for figure eight shape, double and oval shape or single tube sleeves.

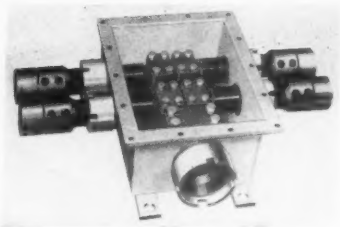
Coupling Capacitor

A new larger type CA carrier current coupling capacitor is announced by the Cornell-Dubilier Electric Corporation, South Plainfield, N. J. In this new unit, the fog type petticoats give a large creepage distance between terminals. The capacitors are constructed with galvanized malleable iron mounting flanges so that they may be stacked for series, high voltage connection. New internal mechanical construction is said to afford great tensile strength.

Both the base and top are sealed so as to afford leakproof service. The capacitor sections are designed for low resistance at high frequencies and very low 60 cycle stress. These individual units are now made up to 46 kv but may be stacked to operate at any desired voltage.

Stainless Steel Boxes

Stainless steel underground junction boxes built of Enduro stainless steel, a product of Republic Steel Corporation, are now available from the G & W Electric Specialty Company, Chicago, Ill. The new type of stainless steel which is an alloy of 18 per cent chromium and 8 per cent nickel, provides great strength and light weight in these underground boxes. Other advantages claimed for



them are indefinite life, watertight construction, non-magnetic material, ease of installation and thinner walls.

Fluorescent Lamp Display

Gruber Brothers, 78 Spring Street, New York, N. Y., have just issued a new folio sheet No. 39-2f which describes a very compact and attractive display of flourescent units for quick showing. The display eliminates expensive showroom wiring costs and can be used in either window, showroom or in special exhibits. The display board is 24 inches by 34 inches and includes a 41-18, a 20-18, a 77-18, and a 30-18 lighting fixture completely wired and ready for live display.

New Fluorescent Auxiliaries

A new fluorescent lamp starter and a current-limiting device known as the fluorescent lamp ballast have just been announced by the Westinghouse Electric & Manufacturing Company. The starter is located in a special socket attached to a standard fluorescent lamp holder by a single screw, making it as easy to replace as the lamp itself. The ballast need not be accessible after installation, hence may be mounted in any convenient place.

Ballasts will be available for single and two-lamp operation. With the latter type, power factor is corrected to approximately 0.95, and when the lamps are adjacent, much of the stroboscopic effect is overcome.

Heart of the new starter is the glow switch, a small glass relay tube containing a bimetallic switch and an easily ionized gas.

When the current is turned on with the glow tube connected in parallel with the lamp, a gaseous discharge is created between the normally open switch contacts, and the resultant heat causes the contacts to close. The glow discharge then ceases, allowing the bimetal elements to cool and separate, thus opening the switch.

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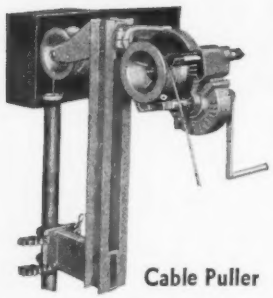
Greenlee TOOLS

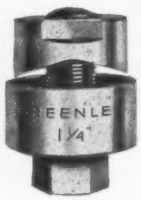
TIMESAVERS and PROFIT-MAKERS FOR THE CONTRACTOR



Cable Puller

No longer is it necessary to use cumbersome, heavy equipment for pulling in cable. The Greenlee anchors right to the conduit through which the cable is to be pulled and is easy to handle and simple to operate.

Knockout Tools



Greenlee Punches and Cutters make it easy to enlarge holes in switch boxes, cabinets etc. They form clean-cut holes quickly and accurately, without reaming or filing.

ASK FOR CATALOG NO. 31E if you don't have a copy. It shows these tools as well as others of interest, such as Hydraulic Conduit and Pipe Benders, Joist Borers, Hydraulic Pipe Pushers and Electricians' Bits.

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GREENLEE TOOL CO., 1707 Columbia Ave.
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Name .....

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City and State .....

My jobber is ES-10-39

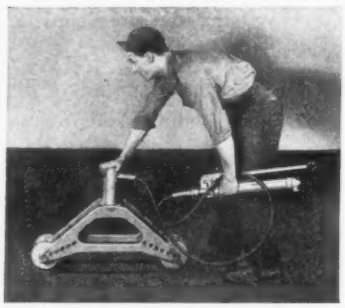
Opening the switch causes a high-voltage impulse to be delivered by the ballast, and the arc is established between the electrodes in the lamp. The entire operation requires only one or two seconds. The glow switch consumes current only momentarily while the lamp is starting.

Connected in parallel with the glow switch, and housed in a small aluminum container with it, is a capacitor to eliminate radio interference.

Additional information about fluorescent lamp starters may be obtained from the Bryant Electric Company, Bridgeport, Conn.; the Lighting Division, Westinghouse Electric & Manufacturing Company, Cleveland, Ohio, will provide information on the lamp ballast.

New Pipe Bender

A new "Porto-Power" Pipe Bender is announced this month by the Blackhawk Mfg. Co., Milwaukee, Wis. Using a 20-ton hydraulic unit, the bender handles seven sizes of rigid conduit and pipe, including 1¼, 1½, 2, 2½, 3, 3½ and 4-inch diameters.

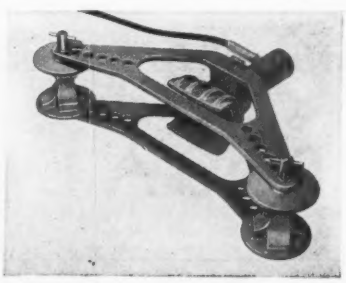


The new lightweight 190 pound unit, Model S-36, has a simplified one-piece bending ram which eliminates 13 various extension bars, tension arms, studs, etc., used in the original 1 to 2-inch Porto-Power bender introduced last year. The manufacturer claims time-saving advantages for the new "pull pin" method of fastening the rotating pivot shoes, a principle which makes wrenches unnecessary in assembly.

The Model S-36 is relatively low in cost, being priced at $216.00 ($222.45 west of the Rockies). The 20-ton Porto-Power hydraulic unit is quickly removed from the bending frame and used with special attachments for pulling gears and pulleys or for lifting over long spans at any angle.

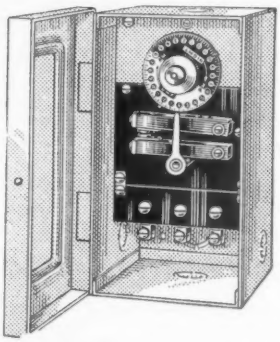
Another new Blackhawk development is the S-30A Pipe Bender which uses a 10-ton Porto-Power hydraulic unit. This model is similar in principle to the S-36 but handles a popular pipe range of 1, 1¼, 1½, and 2-inch diameters and is priced at $97.25 ($101.50 west of the Rockies).

Both the S-36 and S-30A are packed in portable kits for carrying directly to the pipe bending job.



Electric Time Switches

The Wadsworth Electric Mfg. Co., Inc., Covington, Ky., announces a line of electric time switches for automatically controlling electrical circuits for timed operations; for



commercial, domestic, poultry farm and industrial use. The switches are mounted in neatly styled steel cabinets with concentric knockout in top,

bottom, back and sides, finished in durable hard baked aluminum enamel, both inside and out. The units are equipped with synchronous motors, self-starting, sealed in lubrication, and of low wattage consumption.

Pure silver, on copper button type contacts are securely mounted on bakelite contact arms, and a new quick make and quick break switch action, mechanically operated by the motor driven clock movement produces a "wipe action" before contact is broken.

These advantages are claimed for this new Wadsworth development: Keeps contacts in a clean, smooth operating condition. Protection against sticking contacts. Life of contacts are greatly increased. Positive switch action (which is Quick Make and Quick Break.) Trouble-free, long life switch performance.

Thin Wall Fittings

A new type of connector and coupling for thin wall conduit has been announced by the Conduit Fittings Corporation of Chicago, Ill. These fittings, which are listed by the Underwriters' Laboratories, Inc., have a patented feature which, according to the manufacturer, renders them actually watertight. This feature consists of a brass collar which seats against the shoulder of the fitting. The collar is held firmly in place by a small stamped ring equipped with teeth. When the fitting is tightened, these teeth are forced out against the conduit providing a positive grip and a firm seating of the brass collar which results in a tight seal between fitting and conduit.

These new fittings are made of fine quality malleable iron and are available in all sizes from ½" to1". Further information may be obtained by writing the Conduit Fittings Corp., 6400 West 66th Street, Chicago, Ill.

Pyranol Current Transformer

To meet the demand for a smaller outdoor current transformer General Electric offers for the first time a 15-kv Pyranol-filled outdoor current transformer of the porcelain-shell type. The new Type KF-305 transformer is filled with Pyranol, a non-inflammable insulating liquid with high dielectric strength. This insulation will not sludge and provides no fire hazard and it is hermetically sealed.

Adaptable for either horizontal or vertical mounting, the new transformer meets the stringent NEMA accuracy classification of ¼ X, ¼ Y, ¼ Z, and fills the 4.5-inch impulse test-gap requirements of the ASA. Three coats of Glyptal gray paint provide a surface resistant to abrasion. The core and coils are mounted in a shallow cast-iron tank and extend up into a porcelain housing which acts as a high-voltage bushing. High-voltage terminals are threaded studs mounted on top of the porcelain shell. The secondary terminals are fixed studs inserted in a compartment on the base. These terminals are sealed in glass at the point where they enter the tank. This glass seal affords a liquid-tight construction.

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Hubbard Expanding Anchors

A new line of expanding anchors manufactured by Hubbard and Company, Pittsburgh, Pa., has just been announced. The Hubbard Hercules Anchors are constructed primarily to provide a large square-inch holding area against undisturbed earth. The anchors are furnished in three sizes, having expanded areas of 70, 110, and 140 square inches respectively. All three sizes are mechanically tested to more than their rated strength.

Method of setting the anchors is as follows: After the hole is dug, the anchor and rod are lowered into place at the bottom of the hole. Expansion is accomplished by driving on the top of the anchor with a standard installing tool or a pipe large enough to slide off over the eye. A small wire secures the wings in the closed position until the first blow is struck which breaks the wire allowing the wings to take their first "bite" into the walls of the hole. Continued driving not only forces the wings to spread into the hard earth around the hole but draws the anchor firmly against the bottom.

When the wings are completely spread the sound of the blow changes to a solid impact of metal against metal making the final stage of expansion easy to detect.

Design of the anchor prevents the rod nut from turning saving much annoyance and allowing the rods to be reclaimed. Any strain on the rod when the anchor is completely open tends to hold the wings in the spread position thereby eliminating any possibility of collapse.

Book Pictures New Plant

A booklet reproducing thirty-odd photographs of the new plant, offices and personnel, and a ground plan, has just been issued by R. E. Uptegraff Manufacturing Company, transformer manufacturers, Scottdale, Pa. The main structure is more than 500 feet in length by 50 feet in width, and is planned for continuous production. There are two Pennsylvania Railroad sidings directly into the buildings, and three electric cranes facilitate the handling of the heaviest Uptegraff transformers. The booklet, entitled "A Plant Equipped for Building Transformers," is unique in that it is not a catalog, but is entirely

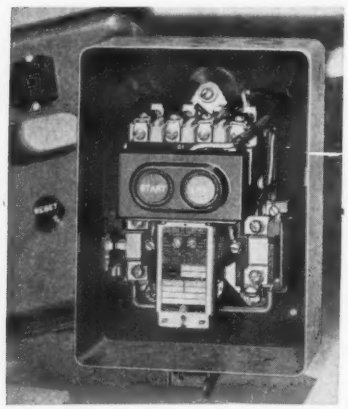
devoted to showing the Uptegraff facilities for transformer manufacturing.

Smaller Size Starter

To meet the demand for an automatic starter for the smaller sizes of polyphase and single-phase motors, the Square D Company announces the new Size O, Type R, Class 8536 starter. Maximum polyphase ratings are 2 hp, 220, 440, 550 volts; maximum single phase ratings are 1 hp, 110 volts or 1½ hp, 220 volts.

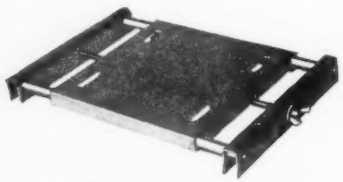
This starter has a vertically operating magnet, double break silver contacts and thermal overload relays. It is offered with general purpose, dust-tight, water-tight or Class II, Group G enclosures; also as a combination starter with either disconnect switch or circuit breaker; also in the reversing type.

It supplements the present line of Square D vertically operating automatic starters and has similar features of accessibility of all parts for inspection or maintenance.



New Low Cost Motor Base

A new, low cost motor base called the "Automatic" is announced by Ideal Commutator Dresser Company, Sycamore, Ill., which automatically maintains correct belt tension through the action of special high grade steel springs. This unique design makes



it especially suited to short center drives. One Ideal "Automatic" motor base covers all types of drives, horizontal, vertical, or overhead. Operates satisfactorily with any type of load, pulsating, steady or reversing.

To take up slack in belts from normal wear and stretch, it is only necessary to give the adjusting screw a few turns. The base moves back instantly giving the correct belt tension. Spring tension holds the motor, takes up slack, cushions load shock that might otherwise damage motor and bearings.

The Ideal "Automatic" tension motor base is constructed throughout of steel. Installation is extremely easy since the motor is mounted directly on to the sliding plate of the base. The complete motor and base is then bolted down as a unit.

Diagrams for Lap Wound Motors

(*Continued from page* 36)

is, without group numbers filled in. Then any one line lead can be selected and traced to a group and it may be called group No. 1. Follow through this group to the next group connected by a jumper and mark it. Then count back to the first group in order to determine the number of the second group. Check through the entire phase in this way and mark all groups. From this data the schematic sketch can be filled in and then a full connecting diagram can be made up.

When making a schematic diagram from any strange winding, keep in mind these basic rules of lap winding connections:

(1) For two-phase windings every third group (1 and 3 apart) belong to the same phase and are of opposite polarity. Also, groups 1 and 5 apart are in the same phase but of like polarity.

(2) The 1 and 3 jumper when used denotes a short or "top to top and bottom to bottom" connection.

(3) The 1 and 5 jumper indicates a long or "top to bottom" connection.

(4) For three-phase windings, every fourth group (1 and 4 apart or 1 and 7) are in the same phase.

(5) The 1 and 4 jumper indicates short or "top to top and bottom to bottom" connection and the groups are of opposite polarity.

(6) The 1 and 7 jumper indicates a long or "top to bottom" connection and the groups are of like polarity.

Thus with a knowledge of the basic rules of a-c lap winding connections, the schematic diagram is a valuable tool for quick reference, and for taking rough data for use later in making the final working diagram. One should study these diagrams, making one or more schematic diagrams and from these construct a complete connecting diagram. This will

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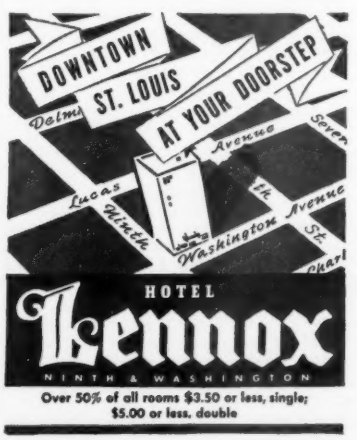
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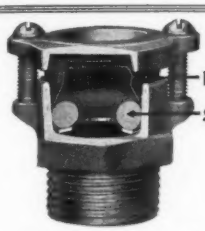

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provide an easy method by which one can soon learn the rules and tricks in laying out a-c connecting diagrams, and for checking windings.

Next month we will start the six pole, two and three phase connecting diagrams and will explain how to check a diagram for correct layout.

Test Procedure For Insulators

(*Continued from page* 29)

with other equipment.

(8) **Porosity check.** Broken fragments of specimen shells are checked for density and absorptive quality of body structure. This check is made by placing the fragments in a pressure cylinder containing a solution of fuschine dye in alcohol, and subjecting them to a hydrostatic pressure of 10,000 lbs. per sq. in. for six hours (or 4,000 lbs. per sq. in. for fifteen hours). After being removed from the cylinder and wiped dry, the fragments are broken again to expose fresh surfaces; these surfaces must show no sign of penetration to the unaided eye. Correctly fired vitreous porcelain will usually show no absorption even after being subjected to pressures as high as 30,000 lbs. per sq. in. for 24 hours or more, although porous or imperfect porcelain will result both from underfiring (incompletely vitrified body) and over-firing (exploded structure). The lower and upper limits of the proper vitrification range are not more than 24 degrees F. below and above the correct firing temperature, which temperature varies for each manufacturing setup and body composition used, but averages about 2,450 degrees F. Thus it is to be noted that the firing conditions must be controlled within at least 1% plus or minus, and are as a matter of fact held to much closer limits than that in modern continuous kilns.

(9) **Corona test.** Where specified, dark room observations of single assembled units or strings are made to determine the minimum voltage (decreasing) at which local corona or overstressing of the air adjacent to any part of the assembly occurs. This minimum voltage may be specified in the contract. This test will soon be supplemented by radio noise influence tests in which the magnitude of the high frequency oscillations generated by the insulator at various commercial frequency applied potentials is measured by a radio receiver capacitatively coupled to the insulator, and calibrated in terms of a standard modulated carrier wave signal. Measurement is made in the broadcast range, 550,000 to 1.500.000 cycles.

(10) **Mechanical time load test.** (Not to exceed ½% of contract). Assembled specimens in strings of convenient length are subjected to a tensile load amounting to 60% of the combined mechanical and electrical strength rating (in this case 60% of 15,000 or 9,000 pounds) for an unbroken 7-day period. They must be mechanically and electrically intact at the end of this period as evidenced by a final flashover test.

(11) **Mechanical impact test.** Specimen assembled insulators (not to exceed ½% of the contract) are given a rapidly applied impact blow on the outermost edge of the skirt while under a tensile load of 2.000 pounds, the blow being applied by means of a copper nosed, weighted pendulum bob having a kinetic energy of 75 inch-pounds at the instant of impact. Insulators shall remain physically and electrically intact.

Trial Installations Test New Wiring Methods

(*Continued from page* 22)

veloped between the bare neutral and metal conduits, indicating that straying currents were negligible.

The party found C.N.X. cable is being used for residence wiring in Buffalo and that the Niagara Hudson Company recently had rewired its building, using bare neutral, and in addition, loaded the conduit fill to 55%.

The party, which was composed of Mr. Muller, representing the city of New Orleans; Ben Z. Segall, representing New Orleans Public Service and the Electrical Association, and George Welman, representing the Rating Bureau and the Association, made the trip under auspices of the adequate wiring committee of the Electrical Association.

They submitted a report on their findings at a meeting of the committee, of which W. E. Clement is chairman, held August 15.

The report was enthusiastically received, especially with reference to the extensive adequate wiring work found at Omaha, Neb. Extensive adequate wiring work is being done there as a means of providing greater conveniences and toward reducing fire hazards and consequently the insurance rates, the committee reported.

The New Orleans Association is making adequate wiring its principal objective for 1939 and has induced many contractors to comply with standards set for this.

It is sponsoring construction of several demonstration "adequate wiring homes." One of these has been completed, but has not been opened pending completion of paving of the street on which it is located. Another toward the lakefront is nearing completion and will be opened shortly.

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Although this book was prepared primarily for the beginner in motor rewinding work, it contains a great deal of practical information that will be found of value even to the "old timers" in the trade. A special feature of the book is the section devoted to the design of tools and equipment useful to the motor rewinding shop.

A glance at the chapter headings demonstrates the scope of this valuable book: Practical Motor Tester Panel, Handy Tools for the Motor Shop, Time Saving Coil Winder, Armature Testing, Testing Stators, Classification of Motors, Split Loop Windings, Loop Windings, Fan Motors, Automotive Armatures, Rewinding Small Polyphase Motors, Capacitor Motors, Brush Troubles and Their Remedies, Insulating Varnishes for Electrical Work.

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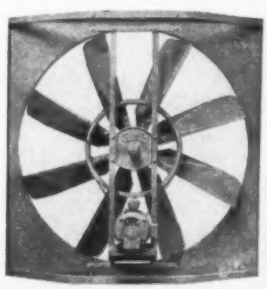

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